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Improving the Process for Add-on Service Delivery in Industrial Business-to-Business Environment

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I have to start by saying that I am indeed glad for my decision to apply for this Master's Program! The studies have required plenty of work but have also offered a very positive experience throughout the year. For me, the best outcome has been the new perspectives gained from the studies, from the instructors and from fellow students.

As I now have this opportunity, I will use it to thank those who have greatly influenced the process of building this thesis.

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I would like to thank my employer for enabling these studies while working. A special thank you goes to my manager who has been very supportive towards the studies from the very beginning. Thank you goes also to all my colleagues who have contributed to this thesis.

My fellow students have made this year very enjoyable, and I feel very lucky to have been a part of this group, so thank you to all!

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This thesis looks for practical methods for an equipment sales organization to improve an internal operational process to deliver add-on services to its OEM customers. The sales organization operates in an industrial business-to-business environment in the Finnish region.

The add-on services discussed within this thesis are considered as extensions to the equipment portfolio. The add-on services are viewed as a method to fill the gap between the recognized customer need and the organization's equipment offering.

The volume of such add-on service deliveries has been increasing within the organization, but there has not been a written process to describe the activity. The lack of a written process has been identified as a limitation for a systematic improvement of the practices.

The improvement of the add-on service delivery process starts with describing the current procedures. The description of the procedures is done by interviewing the key stakeholders of the organization for the Current State Analysis. From the analysis, the strengths and the weaknesses are detected and the main findings which required most improvements are identified.

After the Current State Analysis, the existing knowledge is studied to build the Conceptual Framework for the add-on service delivery process. The Conceptual Framework is used to pinpoint the elements of the process which need improvement.

Next, based on the Current State Analysis and the Conceptual Framework, a proposal for an improved add-on service delivery is co-created with the key stakeholders of the organization. The co-creation is done by collecting ideas from workshops. The proposal is then validated with the director of the case unit to build the final proposal.

This thesis was able to deliver what it promised as it provides a proposal for an improved add-on service delivery process with an action plan on how to start the implementation.

Keywords	add-on service, process improvement

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1 Introduction

In the eyes of the customers, the role of a local area distributor has been decreasing for some years. One major reason for this change is the Internet, which has enabled direct access to the information flow for anyone and at the same time also access to multinational supply chains. This same change applies in many ways also to industrial automation equipment suppliers operating in the business-to-business (B2B) environment. Moreover, the high degree of competition and the variety of options in the market explains why a supplier who is only able to provide equipment is under constant pressure of being replaced by competition.

This development urges a product distributor to figure out additional capabilities to become a more attractive supplier for the customers. One solution to this is a proactive sales force with a service oriented mindset that focuses on understanding the customer need and attempt to provide a solution to that need with a suitable product or set of products. The key element is the understanding of the customer need. As multiple studies on *value* and *value perception* have indicated (Vargo and Lusch 2004; Heinonen et al. 2010), the customers are not interested in products, but instead, they are interested in *the value* which they can extract from the product. It means that the supplier should focus on the customer's value extraction process to be successful. In practice, understanding the customer need means for a product supplier that it needs to understand what the customer wants to achieve and how the customer targets to achieve it. Only after the true need is thoroughly understood, the supplier can study whether there is a gap between the current supply and the customer need which could open an opportunity for new business. If there is an opportunity, the supplier needs to be able to efficiently fill the gap between the actual customer need and the current offering to make a successful proposal to the customer. In the B2B context, filling this gap transfers some share of the customer's integration complexity from the customer to the supplier's scope of delivery.

To fill the gap calls for new abilities from the supplier. Accordingly, if the supplier is not well organized to provide these kinds of additional services in an effective way, the result is that the sales may capture some of the new business opportunities, but the order fulfillment process will struggle to deliver them. In practice, the delivery process

may be too heavy, costly, complex and time-consuming which means that the supplier is unable to deliver the services and be profitable at the same time.

In the case unit, the number of add-on service deliveries has grown in recent years and based on the feedback from the customers it is estimated to continue increasing. But currently, there is no existing written process description for the add-on service delivery. For these reasons, this thesis focuses on developing an improved service delivery process which would make the internal operations as linear and transparent as possible to efficiently fulfill customer needs.

1.1 Key Concepts

In order to tackle add-on service delivery in an industrial business-to-business environment, the following four key concepts need explaining:

Add-on services are services which are offered to customers in order to increase the share of captured business opportunities. This thesis uses the term “add-on services” instead of customization to highlight the nature of the services as extensions to standard offering.

Purchasing practices are methods applied to specify the source of supply and acquire raw materials and services to produce the desired result.

Knowledge transfer relates to how the organization can ensure that the organizational knowledge is available for the users.

Knowledge sharing addresses how the organizations can ensure that the members of the organization share their knowledge to the other members.

1.2 Case Company Background

The case company is a Finnish family-owned company with a long history of operating in an industrial business-to-business (B2B) environment in multiple sectors of the industry. It has approximately 100 employees with revenue of around 30 million Euros. The add-on service delivery process discussed in this thesis concerns one business unit of the company with approximately 20 employees. The case company consists of

three separate business units in their particular fields of expertise. Two of the business units are project-execution organizations. Both of them provide complete systems to their customers and also offer maintenance services for the delivered systems. The third unit, to which this thesis was produced for, is a sales organization dealing with industrial automation equipment. The unit focuses on doing business with Finnish original equipment manufacturers (OEM) and other related companies such as engineering companies and system integrators.

The offering of the case unit consists of a wide range of industrial automation equipment from various manufacturers. The equipment portfolio covers a broad selection of devices that are used for example to measure or to control a machine or system. Two fast-growing sectors are related to machine safety and industrial networking. The case unit does not produce the equipment itself but instead the business is based on being a local distributor for mainly Central European and US-based automation equipment manufacturers in the Finnish region.

1.3 Business Challenge

The case unit has a long history of operating as a local distributor of industrial automation equipment in the Finnish region. The business is based on the case unit having a good knowledge of Finnish customers, high level of technical knowledge of the represented equipment and the applications that they are most suitable for. The sales of the automation equipment to the OEM customers and large end user customers generate a vast majority of the revenue.

The case unit organization has recently detected that a growing number of new business opportunities require an ability to provide a wider scope to the customer beyond equipment to be able to capture the opportunities. One reason for this development is for example that customers' own organizations have been streamlined in the past years in a way that they do not have the extra capacity in-house, so they look for other companies to partner with who have the ability to provide a solution to the customer need.

The case unit has responded to this emerging trend by starting to provide these kinds of add-on services to selected customers. The driving force for the sales personnel has been the desire to supply the customer with the equipment and to reach this target it has required the sales personnel to find a suitable method to refine the equipment to

meet the customer need better. The case unit does not have any internal assembly or production capability which means that every time the required add-on service goes beyond the level of what is possible to provide with internal resources, the case unit needs to cooperate with an external partner or a subcontractor.

The challenge that the unit is facing is that without organizing the internal operations and the cooperation with the external partners and subcontractors, the case unit personnel have to consume a vast amount of time and energy to provide the promised add-on services. For example, the sales order processing is immediately halted if the responsible sales person is not present to handle the needed subtasks as they may not be documented in a way that is accessible to all participants. These kinds of issues limit the possibilities to provide the add-on services on a larger scale as by adding the workload they simultaneously effect the organization's capability to handle the basic day-to-day operations.

Although there is a variety of different kinds of add-on services that are provided to the customers, they can also be arranged to different groups which all have common nominators that can be used to build an operational process to them.

1.4 Objective and Scope

The objective of this thesis is *to improve the add-on service delivery process for the case unit.*

Unified practices are needed to ensure that the organization is capable of handling the growing number of add-on service deliveries to the customers.

The outcome of the thesis is to provide the case unit with *an improved add-on service delivery process.*

The scope of this thesis will be defined during the Current State Analysis in Section 3, as the thesis will then decide the type of add-on service which needs the improvement the most.

This thesis focuses on improving the add-on service delivery process within the case unit by studying the most suitable way to be organized for them, including both internal

and external resources. The need to get organized for this process exists after the sales process has captured the opportunity with the customer. Therefore, this study does not take into consideration the customer perspective in any great detail since it is already covered in the sales process. But instead, it focuses on the add-on service delivery to find improvements which ensure that the case unit can deliver the agreed add-on services as efficiently as possible.

This thesis is written in a total of seven sections. This first section introduces the current business challenge and the business context. It also discusses the objective and the scope of this thesis. Section 2 describes how the research is constructed and how the data collection was organized. It also discusses the methods which are used to ensure the validity and reliability of this thesis. Section 3 looks into the results of the data collection and shows the path of building the Current State Analysis of the existing add-on services. Section 4 discusses the best practices on purchasing practices and knowledge management and presents the Conceptual Framework of this thesis. Section 5 discusses the building of the proposal of the new add-on service delivery process for the case unit. Section 6 presents the final proposal and the action plan for the implementation of the new process. Section 7 summarizes the thesis, reflects the outcome in relation to the objective and evaluates how the reliability and validity were carried out in the final product.

2 Method and Material

This section discusses the research approach and the research design of this thesis. Also, it describes the data collection practices and analysis process and the plan for creating a valid and reliable thesis.

2.1 Research Approach

The research approach of this thesis is a qualitative single-case study. According to Denscombe (2014), a case study is typically used when a researcher wants to study in deep detail the research phenomenon that occurs in its natural environment. A case study is considered to be suitable method when the researcher wants to study the relationships and the processes.

The case study may be conducted as a single-case or multiple-case study. A multiple-case study can be used to study the occurrence of the same phenomenon in a broader context which is often considered to provide more robust results (Yin, 2003). But Yin (2003) further argues that there are certain rationales that support selecting a single-case approach such as revelatory of the case which points that the researcher has access to knowledge of one single case.

The method to collect data for the case study can be done as quantitative or qualitative or even combination of them both. The quantitative data is typically collected using statistical or mathematical methods as the qualitative data is collected by interviewing or observing a phenomenon. Qualitative case study approach enables the researcher to get answers to questions “why” and “how” (Baxter and Jack, 2008), and is a research approach which explores the phenomenon within its context using different types of data sources. The reason for this is to ensure that multiple perspectives are taken to research the phenomenon (Baxter and Jack, 2008).

Baxter and Jack (2008) argue that if the researcher has case specific propositions available as a starting point to the case study, it helps the researcher to limit the scope of the research as well at it helps the research to be completed. These propositions may be for example existing studies, personal or professional experiences or existing theories.

The selected research approach for this thesis is a qualitative case study as the objective is to improve the add-on service delivery process within one particular equipment sales organization. These services already exist although they are not described in written form so they must first be described, and this is done with qualitative interviews. After describing the existing process, they can be further analyzed.

2.2 Research Design

The research design of the thesis follows the selected single case study approach. The research design is built to move the research forward in a series of linear steps that all target to bring the objective closer to the outcome and at the end meeting the outcome. The data for the research is collected in multiple stages to support the outcome. The research design is presented in Figure 1. In Figure 1 the data collection stages are presented on the left side and the outcome of each step on the right side of the figure.

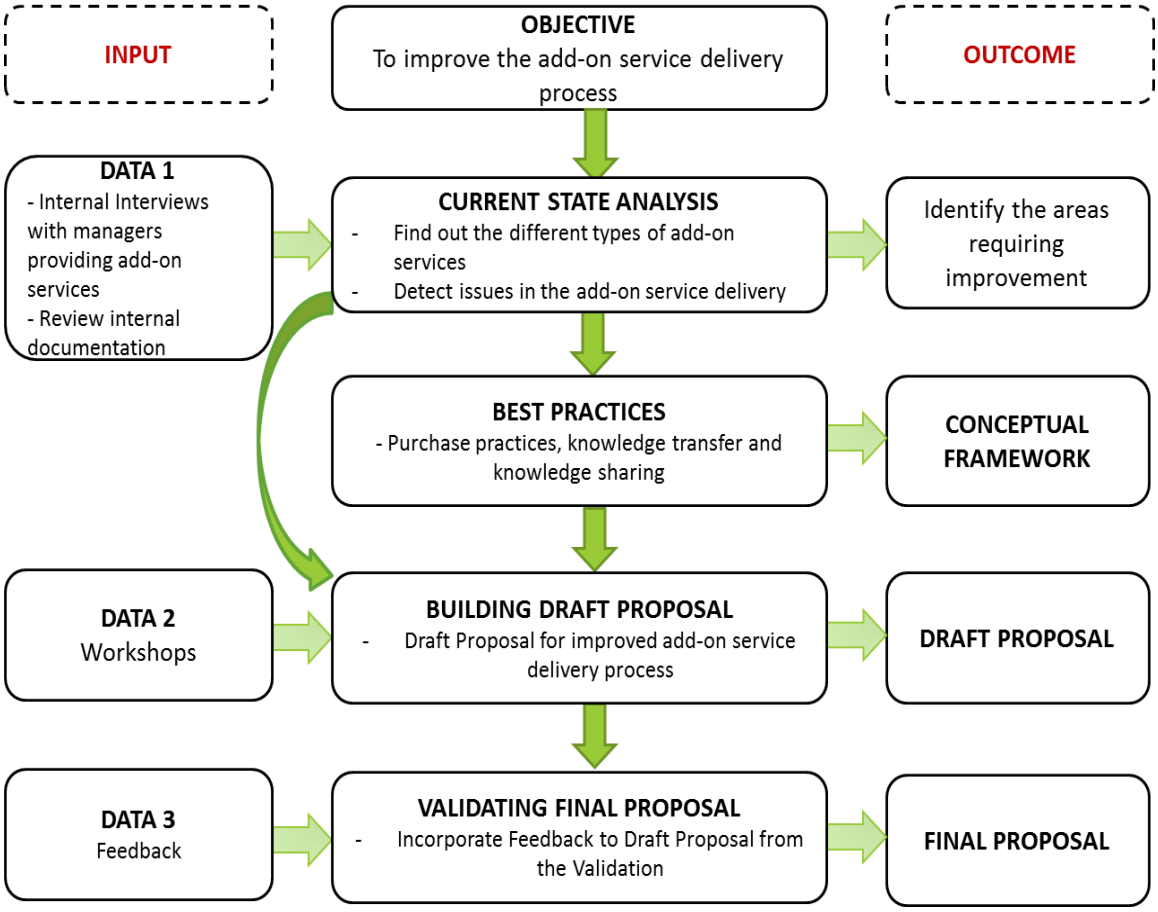

Figure 1. The research design for the thesis

As presented in Figure 1, the research design begins with stating the objective of the thesis. The objective is to improve the add-on service delivery process which is currently used within the case unit.

The next step in the research is to conduct Current State Analysis (CSA) to identify how the add-on service delivery procedures are currently handled. The CSA is carried out by conducting interviews with the stakeholders within the case unit and by studying the existing company documentation. The outcome of the CSA is a description of the current procedures related to the add-on services with a documented listing of strengths and weaknesses.

Step three, described as Best Practices in Figure 1, is to search the existing knowledge and best practices to find most suitable methods to improve the main weaknesses discovered in the CSA. The outcome of this step is the Conceptual Framework for the add-on service delivery process. After introducing the Conceptual Framework, the next step is to build the proposal for the improved add-on service delivery process. The building of the proposal is based on the findings from the CSA and the best practices. The proposal is co-created in workshops with the case unit stakeholders to capture the improvement ideas most suitable in the case unit context. The co-created proposal is then validated with the management of the unit and the feedback from the validation is incorporated into the final proposal. After the final proposal is presented, an action plan is presented to get the implementation of the improved add-on service delivery process started.

2.3 Data Collection and Analysis

The data collection for this thesis was done in three phases. Data 1 was collected in the CSA phase. Data 2 was collected in the building of the proposal phase and finally Data 3 was collected in the validation phase of the final proposal. After each data collection round the collected data was analyzed.

Data 1 was collected by interviewing multiple stakeholders within the case company who are involved in the add-on service delivery process. Each interviewee has a different responsibility area and, therefore, different viewpoint to the subject. The interview questions searched for answers to what types of add-on services are currently provided to the customers and what are the related procedures to identify what are the

responsibilities and who are the participants. It also studied how these services are delivered in practice and what strengths and weaknesses the interviewees had detected in the procedures.

Interviews were conducted, and the field notes were documented in the Finnish language and afterward translated into English for interview summaries by the researcher. The company language is Finnish, and also, all the interviewees have Finnish as their native language. By using the Finnish language, the researcher was able to ensure that key findings would not be missed due to possible language issues. The researcher also estimated that this approach would also be the most beneficial for the case company. The list of the interviews conducted for this phase is collected into Table 1.

Table 1. Summary of Data 1 collection and analysis

ID	Position	Date of the interview	Duration	Interview style	Documentation method	Note	Transcribed Documentation	Data Analysis
1A	Product Manager	February 2016	25 min	face to face	field notes		Appendix 1	Section 3
1B	Product Manager	February 2016	90 min + 5 min	face to face	field notes	additional check-up discussion		
1C	Product Manager	February 2016	95 min + 5 min	face to face	field notes	additional check-up discussion		
1D	Product Manager	February 2016	70 min	face to face	field notes			
1E	Product Manager	February 2016	75 min	face to face	field notes			
1F	Technical customer service	February 2016	45 min	face to face	field notes			
1G	Purchasing	February 2016	60 min	face to face	field notes			

As Table 1 indicates, there were two interviewees, 1B, and 1C, who were shortly interviewed for a second time for checking up issues that were not covered in the original interviews. The reason was that when analyzing the data from all of the interviews, it was revealed that a possible issue in the add-on service delivery process was not

noted at the time of original interviews. The two check-up discussions confirmed that there indeed is an issue related to practices on how the customer quotations are prepared and the way the add-on service deliveries are documented to the company system. These issues are discussed in detail in sections 3.4.3 and 3.4.12. In addition to the interviews, also the existing company documentation related to customers, delivery processes, and ERP documentation were reviewed and reflected and this documentation listed in Table 2.

Table 2. List of reviewed internal process documents

Document Name	no of pages	Time of review
CRM Process description	13	February 2016
Service Process description	18	February 2016
Project Process description	31	February 2016
Technical trade Process description	39	February 2016
ERP instruction manual, creating new item codes	17	March 2016

Data 2 was collected in workshops with the stakeholders. The workshops took place after the Current State Analysis was completed and the best practices from the existing knowledge were studied. The workshops were conducted by presenting an initial proposal for the add-on service delivery process with highlighting the points to which improvement ideas were requested. The data collection for Data 2 is presented in Table 3, and the transcribed documentation is presented in Appendix 2.

Table 3. Summary of Data 2 collection and analysis

ID	Participants	Date of the Workshop	Duration	Documentation method	Transcribed Documentation	Data Analysis
2A	1. Purchaser 2. Customer Manager 3. Warehouse employee	April 2016	60 min	field notes	Appendix 2	Section 5
2B	1. Product Manager 2. Product Manager	April 2016	50 min	field notes		

After Data 2 captured from the workshops was analyzed, the findings were implemented into the draft proposal. This draft proposal was then validated with the management of the case unit and the feedback for the draft proposal was collected as Data 3.

Table 4. Summary of Data 3 collection and analysis

ID	Participants	Date	Duration	Documentation method	Detailed Documents
1	Unit Director	April 2016	45 min	field notes	Section 6

The draft proposal used in the validation is presented in Section 5.4, and the related tables with participants and their responsibilities within the add-on service delivery process are presented in Table 13 and Table 14. The decision, made by the researcher, to present the draft proposal to a single individual was made based on the structure of the organization and on the nature of how the draft proposal was built. The draft proposal was built in cooperation with the key stakeholders of the case unit and therefore it had the initial approval from them. Therefore, the co-created draft proposal was presented to the head of the case unit for it to become validated. The validation of the proposal is discussed in detail in Section 6.

2.4 Validity and Reliability Plan

Quinton and Smallbone (2006) divide a validity of research into two elements, using terms internal and external validity. By their definition internal validity is typically described as estimation or validation of whether the study provides what it promises, meaning that whether the outcome of what was measured actually is what the researcher intended to measure. On the other hand, the external validity measures that to what extent could the results of the study could be applied to different context or situation. Quinton and Smallbone state (2006) that for these reasons the external validity relates to quantitative studies but not to qualitative studies. The selected research approach for this study is a qualitative case study and therefore, the external validity is concerned as not applicable, but instead the focus is placed on ensuring the internal validity of this study.

Yin (2003) defines three principles of data collection which help the researcher to build a solid foundation for the case study and thereby increase the validity and the reliability of the case study. According to Yin (2003), the first principle is to use multiple data sources in data collection to ensure that the collected data would not be observed with a too narrow scope. The method to use a variety of data sources, such as interviews and for example documentation is called *triangulation*.

Yin (2003) argues further that the second principle of data collection is to build case study database which consists of the collected data in an organized form. The database is recommended to consist of two separate collections, the first being the evidentiary findings collected during the study such as the raw data from interviews, field notes, narratives and other documentation. The second collection would be the report produced by the researcher in an article, report or book form. Yin (2003) further argues that the reliability of the study is indeed increased by building a solid case study database since it enables the researcher to provide the reasoning for an external observer looking further details to the conclusions that the researcher has made from the collected data.

The third principle to build reliability into a case study, according to Yin (2003), is to maintain the chain of evidence from the collected data. By maintaining the chain of evidence, the researcher allows an external observer to follow the logical steps of the research starting from the research question all the way through the study to the conclusions and discussions.

The researcher of this study recognized his bias because he is a member of the organization but the attempt is to approach the objective with an open mind. So all these principles described above are followed in this thesis to build a sound and solid single case study that focuses on producing an outcome that would have value to the organization.

The reliability and validity of the outcome are then evaluated in section 7.3.2 Validity and Reliability.

3 Current State Analysis

This section views the current state of the add-on service delivery procedures within the case unit. It first identifies the types of add-on services that are delivered to the customers and then explores deeper one particular type of add-on service delivery. It then determines the strengths and weaknesses of the current practices.

3.1 Overview of how the CSA was conducted

The CSA was conducted in the case unit in February 2016 first by mapping the current methods to deliver the add-on services to the customers. The CSA started off by first making an initial enquiry to case unit's sales personnel, the product managers, to identify whether they actively quote for add-on services related to their products. In this context, the add-on services were considered to be the kind that expands the standard equipment offering, and that also increase the monetary value of the delivery.

All the personnel who informed that they do provide such add-on services were asked to be interviewed, and all of them agreed. The interviews were conducted to capture in detail what types of add-on services currently are provided as well as the related practical procedures. After interviewing the sales personnel, the viewpoint to the add-on service delivery was expanded by interviewing a person from the purchasing. The interview with the purchasing revealed many practical issues related to the order fulfillment of the add-on services. This interview was the most important to understand the exact issues which cause most of the difficulties in the internal processing.

After the interview round had been conducted, the different types of add-on services were identified, described and categorized. The categorizing of the add-on services pointed out that there is one particular type of add-on service which requires the most improvement, and that is the one which requires external resources, such as subcontractors, to be delivered. For this reason, the improvement focus was placed on this type of add-on service deliveries.

After all the interviews had been conducted, two interviewees were interviewed shortly for a second time because the original interviews had not sufficiently covered the details on operating with the external resources and the handling of the technical documentation.

Before moving on to further details for the add-on service delivery procedures, the next section looks in more detail at case unit's way of operating and its current business model.

3.2 Case Unit and Current Way of Operating

The case unit has a long history operating as a local sales channel for foreign automation equipment manufacturers in the field of process and factory automation. It operates with business-to-business (B2B) customers, and the business is continuous with the target customers. The equipment supplied to the customers is not standalone machines, but instead, they are the building blocks for customers to manufacture automated machines that perform dedicated tasks. The case unit is a sales channel for multiple different equipment manufacturers who mainly are small or mid-size companies specialized in manufacturing some certain product or technology and have decided to handle their export sales through a dedicated sales channel.

For the case unit, the wide variety of manufacturers enables to offer a broad scope of equipment and thereby to make itself a more attractive partner to its customers. This model of operation also enables the case unit to expand the equipment portfolio with new manufacturers when for example a new kind of customer potential is detected.

Case unit's organization consists of product managers who act as a link between the customers and the equipment manufacturers. Each product manager has their field of expertise and their named target customers. Product managers are also business developers and they actively propose solutions to the customers. If the business potential with the customer is outside one product manager's expertise, he then involves product manager with the particular know-how to get assisted. The product managers are internally supported by the sales order processing, the technical customer service, the purchasing, and the local warehouse.

In simplified terms, the case unit's business model is to find new business opportunities for the represented manufacturers, agree on the terms of delivery with the customer and then start delivering the products while maintaining the existing customer relations as well. In this business model, the customers are offered free-of-charge services such as technical support, a local stock, warranty handling procedures, and invoicing with agreed terms of payment.

A growing number of endeavors to capture new business opportunities with the customers include additional services to be delivered with the equipment. The next section identifies the current add-on service offering methods and types.

3.3 Identifying the Current Add-on Service Types

The interview stage of data collection 1 revealed that the common nominator for all the add-on services provided to the customers is that the details are agreed with each customer company separately by the responsible sales person. From this perspective, the whole add-on service sales-delivery process can be divided into three steps where the starting point is when the potential for customer need in detected. This potential is then further explored by the sales person by finding a suitable service solution and making a quote to the customer. Should the quote meet the customer need, the customer will then place an order for it, and the add-on service is delivered as quoted. This simplified model of add-on service delivery process from sales to order fulfillment is presented in Figure 2.

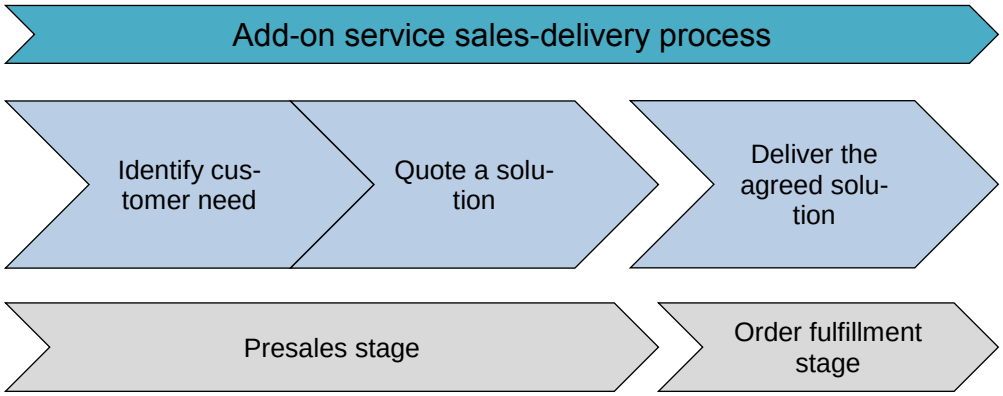

Figure 2. Simplified presentation of the add-on service delivery process

Approaching the add-on service delivery from a process perspective, as presented in Figure 2, the simplified process can be considered to contain two main stages. The first stage of the process is where the customer need is first detected and identified, and a proposal in the form of a quotation is presented to the customer. This thesis uses name *presales stage* for this stage to identify it as an independent element in the add-on service delivery process. The reason for this is that the customer decides whether the proposed solution fulfills the customer need. And only should the customer to decide to place the order, will the process continue to the next stage, named here the *order fulfillment stage*.

The gap in Figure 2, which separates the presales stage and the order fulfillment stage, presents the discontinuation point within the add-on service delivery process. This discontinuation is a result of the customer's decisive role in the process since not all the quotations result in order. Typically in a sales organization, there are more quotations sent than orders received and same applies to the add-on services. It is considered to be a normal nature of the business.

The questions conducted for the CSA, begun each interview by asking what kind of services the interviewee delivers to their customers. The field notes for all the interviews for the CSA are presented in Appendix 1. The outcome was that there are three major types of services, which are identified and listed in Table 5. These are the add-on services that are actively proposed to capture the business opportunities, especially for new customers.

Table 5. Add-on service types provided by the case unit categorized

Type	Description	Example
1	Customer Training	Customer training for Machine Safety Regulations
2	Equipment Commissioning	Equipment is delivered to the customer normally and is commissioned at customer premises
3	Equipment Customization, divided into classes	
3a	Simple, done in-house	Preconfiguring or programming the equipment prior to delivery
3b	Complex, using external subcontractors	Designing and assembling the equipment to a control cabinet. Preassembled product combinations

The add-on services, listed in Table 5, are currently provided and delivered to the customers although there is no written process description in the company that would describe their delivery in detail. For type 1 and type 2 services, customer training and equipment commissioning, this is not an issue since the delivery of these services is very linear and can be controlled by the person who makes the proposal to the customer. They both require work and specific knowledge to be delivered but the responsibilities, and the needed actions from a process point of view are clear.

Type 3 add-on services, which are gathered in Table 5 under a common name of equipment customization, include more complexity. They include the largest amount of additional work, involve multiple stakeholders and can be delivered with specific actions and instructions only. Type 3 add-on services are further divided into two subsections, 3a and 3b, based on what is the procedure to deliver them. Type 3a add-on services, named here simple customized add-on services, consist of the kind of procedures that the case unit personnel are capable of delivering in-house, without a need to use heavy tools or machining or additional accessories. Type 3b add-on services, named as the *complex customized add-on services* by the researcher, are the most cumbersome to deliver since the delivery process involves both internal and external resources, such as subcontractors. Based on the interviews of the key stakeholders, type 3b add-on services are the types which most urgently need further improvement and, therefore, this thesis focuses on this type of add-on service delivery from this point on.

3.4 Analysis of Current Complex Customized Add-On Service Delivery Process

The detailed studying of the complex customized add-on service delivery procedures via stakeholder interviews revealed that the ultimate target of all the add-on service deliveries from the business point of view is the same. The target for offering the add-on services is to increase the equipment sales. The delivery of customized add-on services requires external resources since the case unit does not have facilities or resources to provide needed engineering work or assemblies.

The complex customized add-on service delivery follows in principle the same steps as all the other add-on service deliveries as presented in
Figure 2. But with the complex customized add-on services, the difference at practical level starts already at the presales stage when the preparation for the customer quotation is conducted. The reason for this is that the customer quotation includes sub-elements which the organization is unable to provide with its current internal resources, such as constructing or complex assemblies. Therefore, the customer quotation cannot be proposed without finding a solution to fill this gap between the customer need and the existing offering. Currently, it means that external resources, such as subcontractors, are needed. The subcontractor is the vital part of the puzzle which enables the complex customized add-on service delivery and is therefore involved already at the presales stage.

Since the subcontractor's input to the potential delivery is already included as a part of the customer quotation, the presales stage is considered to be the starting point of the add-on service delivery process. The reasoning is that the subcontracting has a major influence on the actual delivery, should the customer order the quoted proposal. The steps included in the presales stage of complex customized add-on service delivery are presented in Figure 3. The numbering in each element of Figure 3 indicates to subsection where they are discussed in detail. The coloring of the different steps indicates whether there were issues detected which were identified as weaknesses.

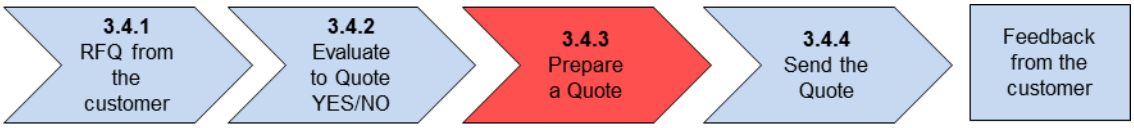

Figure 3. The steps within the presales stage of the complex customized add-on service delivery

The light blue color in the steps in Figure 3 indicates that no specific issues were detected whereas the red color indicates that there was a variation in the way the procedures within the step were handled between the interviewees. The starting point for the presales stage was selected by the researcher to be the point when a customer sends a request for quote. Even though the request is most likely a result of the sales activity, also the customer may be proactive in this sense.

Presales stage

3.4.1 Receiving Request for Quote (RFQ) from the Customer

The request for quote (RFQ) from the customer sets the preparing of the quotation process in motion and is considered as a starting point of the presales stage. According to the interviewees, the RFQ for the add-on service is a result of interaction with the customer during sales contacting. So the sales propose add-on services to the customer if they sense that there could be potential for it.

> Usually, it starts with customer contacting me with an enquiry about some equipment. When I discuss with the customer about the system he is planning to use the equipment, it often turns out that there is potential to offer larger scope. (Interviewee 1C, Appendix 1:4)

> The whole process begins with discussions with the customer, where the potential customer need is first recognized. Then we discuss further to get the understanding that what the customer application is.
> (Interviewee 1B, Appendix 1:2)

After the initial discussions, if there is a potential for business opportunity detected, the sales will explore the subject more to the point that the customer requests for a quote.

3.4.2 Evaluation of the RFQ

When the scope of delivery is recognized, and the requirements for system functionality from the customer are known, then the RFQ is evaluated whether it is suitable to be quoted. The evaluation is done on both technical and commercial perspective, and this is carried out by the individual sales person.

> I decide whether it is suitable and reasonable for us to make a quote. If the value of the quotation exceeds a certain limit, then I will discuss with my manager before proceeding.
> (Interviewee 1D, Appendix 1:6)

> After I understand the customer need, I decide whether I will start preparing the offer. I will not offer unique cases, but they have to have the potential for continuous business with the same customer, or they have to have the capability to be repeated with other customers with the same need.
> (Interviewee 1B, Appendix 1:2)

The technical evaluation considers whether the current product portfolio has equipment that can provide the required functionality. The commercial evaluation considers whether there is enough commercial potential for the case unit to start preparing the quote. The interviews showed that there are no common practices on how this commercial evaluation is carried out, some interviewees informed that they also quote one-time systems, others informed that they only quote for systems that lead to continuous business with the customer. The existing documentation sets no lower limit in Euros for quotations, but there are upper limits on the value of the quotation that instructs the quotation be discussed with the management before it can be continued. So if the upper limit is not reached, the sales person can rely completely on his judgment to decide whether to carry on or not.

3.4.3 Preparing Quotation for the Customer

When the decision to quote is reached, the product manager will start preparing for the quote by selecting the suitable equipment from his product portfolio and in cooperation other product managers other components that can be used in the proposal.

> I select the devices to be used plus possible additional components in cooperation with other Product Managers and I select the partner from whom I'll enquire the quotation.
> (Interviewee 1E, Appendix 1:7)

> I start preparing a quote by selecting suitable products from our department's portfolio in cooperation with other product managers and assembly plus accessories from a subcontractor.
> (Interviewee 1D Appendix 1:6)

When the suitable equipment is decided, the product manager will contact a subcontractor for a quote for subcontracting and the needed additional accessories. There are no common practices on how to select subcontractor, and the interviewees informed that the selection is based on previous experience or knowledge.

> Currently, I am not aware of the subcontractors that the others use so I rely on the ones that I have been working with.
> (Interviewee 1D, Appendix 1:6)

Due to the lack of knowledge everyone is cooperating with the subcontractor they prefer to work with their quotations.

The interviews further revealed that there are no common practices on how to make the enquiry from the selected subcontractor or what is required to be included in the delivery besides the actual assembly:

> Usually, the subcontractors make the drawings, and they are supplied along with the assembly. Sometimes they are the paper format, but I am sure that they are available from the subcontractor. I have not specified any format how they should be delivered.
> (Interviewee 1B, Appendix 1:3)

The lack of accurate specifications is identified as a weakness by the researcher as it directly effects on the case unit's ability to store the delivery details to company records later at order fulfillment stage and increases cost if added later to be included in the scope of delivery.

3.4.4 Sending the Quotation to the Customer

After the product manager has prepared the quotation, he then delivers it to the customer. The quotation is discussed with the customer to ensure that it meets the need recognized from the earlier discussions.

> After I have sent the quotation to the customer, the feedback is then discussed, and possible change requests are noticed and then updated quotation is sent.
> (Interviewee 1B, Appendix 1:2)

> Then I prepare a quote, ask feedback from the customer and make some adjustments if needed.
> (Interviewee 1D, Appendix 1:4)

If the customer feedback reveals that some changes need to be applied, the product manager will take it back to the subcontractor if needed and send a newly revised quotation if needed. After the quotation has been sent to the customer, the process is interrupted. The customer organization will make the decision whether to proceed or not with the quotation and this cannot be controlled from the outside.

Order fulfillment stage

If the customer decides to place a purchase order, it acts as a trigger for the order fulfillment stage of the complex customized add-on service delivery to begin. The biggest difference between the complex customized add-on service delivery and a normal sales order delivery is that the equipment is not supplied from the case unit's stock to the customer, but instead, the equipment has to make an additional route to the subcontractor before the equipment can be delivered as finished goods to the customer. As such this procedure includes several points that need to be taken care of and considered to avoid errors and confusion along the way.

The order fulfillment stage, presented in Figure 4, is a direct continuum to the presales stage presented in Figure 3, given that the customer decides to place the order. As earlier, the numbering in each element indicates to a subsection where the step is discussed in detail, and the coloring follows the same logic. The light blue steps indicate that there were no specific issues detected, the red colored step indicates that there were various ways to handle the procedures in the steps which were identified as weaknesses.

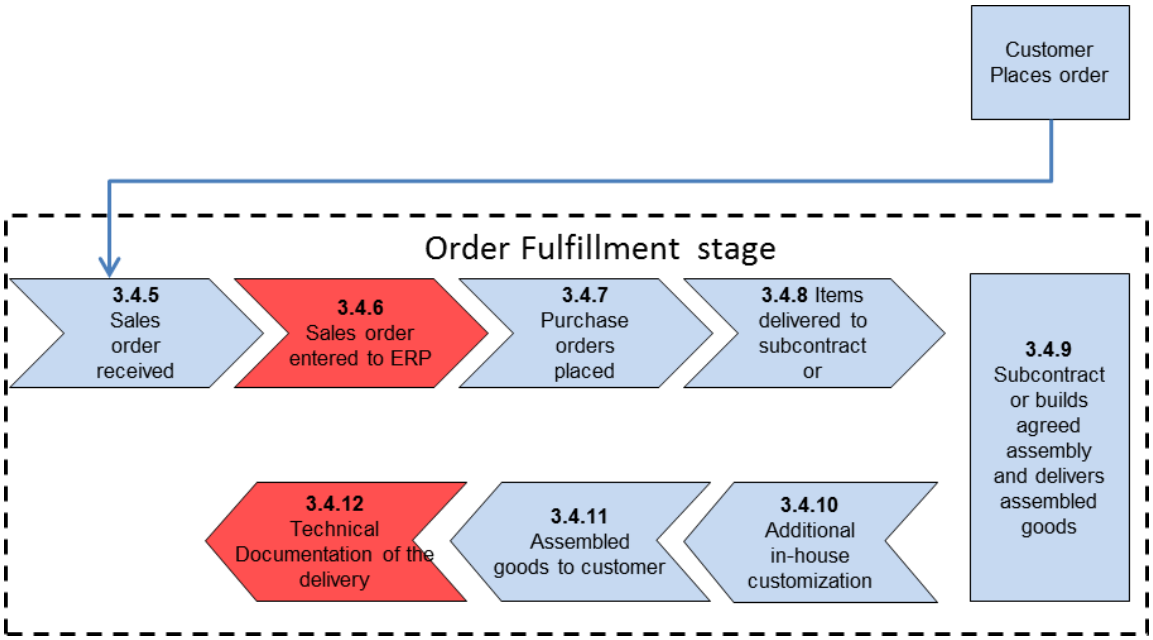

Figure 4. The steps within the order fulfillment stage of the complex customized add-on service delivery

The steps included in the order fulfillment stage of the complex customized add-on service delivery, described in Figure 4, involve multiple participants who each have their own responsibilities in the delivery. The participants and their responsibilities are presented in Table 6.

Table 6. The participants and their responsibilities at order fulfillment stage

Participants	Duties and Responsibilities
Product Manager	Checks that customer order complies with quotation Requests new item codes to ERP system Enters the new sales order to ERP Performs additional in-house customization Releases goods to be delivered
Sales Order Processing	Creates new item codes to ERP according to request
Purchasing	Places new purchase orders for non-stocked items Places purchase order for subcontracting Follows up the deliveries
Suppliers	Supplies the equipment
Warehouse	Receives items from suppliers Sends items to subcontractor Receives the finished goods from subcontractor Sends the finished goods to customer
Subcontractor	Applies the installation and accessories according to order Sends the finished foods

Table 6 lists all the participants and their roles in the order fulfillment process. Their roles in detail are discussed in the sections which discuss the details of each step.

3.4.5 Order Received from the Customer

The order fulfillment stage for the new add-on service delivery starts when the customer sends a purchase order to the case unit. The responsible product manager inspects the order to confirm that it complies with what has been agreed with the customer. The content of the order is a result of the sales process that has occurred at the presales stage. When the customer sends in the purchase order, the product manager already possesses the knowledge of how he will deliver the customized add-on service in that particular case. The reason is that he has already negotiated the details with a subcontractor before the customer quotation is sent as described in Section 3.4.3.

3.4.6 New Sales Order Entered to ERP system

After the purchase order from the customer is inspected, it needs to be entered into the ERP system so that it becomes a sales order so that the delivery process can start:

> After the first order is received, then new items are added to our ERP system. After that, the sales order is entered into the system.
> (Interviewee 1B, Appendix 1:2)

To place an order to the ERP system, all the needed equipment must have unique item codes created into the ERP System. This item code data includes all the information related to the item, for example, supplier information, supplier product codes, purchasing price and selling price amongst other things. The customization delivery may consist of multiple components or equipment from different suppliers, and each needs unique item code before they can be handled at ERP system.

The interviews revealed that there are multiple ways how the sales order are entered into the ERP system after the needed item codes are created.

> The item codes and the subcontracting work must now be entered to the ERP as separate items, we should have one item in the sales order that includes all the parts and labor but customer would only see the one line, like is in the customer order.
> (Interviewee 1B, Appendix 1:2)

> When a customer sends the order, I request new structure code to be created to the system. This construction includes our parts and subcontracting work.
> (Interviewee 1E, Appendix 1:7)

The methods used to start the order fulfillment process in the ERP system was identified as a critical point since it has a major effect on all the steps that follow it. The underlying reason is that different item types behave differently within the ERP system. A comment from an interviewee pointed the sense of complexity within the practices:

> Order processing and opening new codes to the system is complicated and would need to be easier for us.
> (Interviewee 1D, Appendix 1:6)

The variation in the used methods to handle the customized add-on service deliveries in the ERP system was identified as the main weakness which needs further actions to be improved. The reason is that the interviews revealed that there is an existing method dedicated to handling subcontracting orders, but this knowledge has not reached all of the key stakeholders.

3.4.7 Purchasing of equipment and subcontracting work for the delivery

After the sales order has been entered into the ERP system, it will automatically reserve equipment from free inventory and create a list of needed items for the purchasing. Using this list the purchasing can then place orders for the needed equipment and the subcontracting work.

> If these item codes are set up as “to-be-ordered” from the subcontractor, then the item code itself includes our components, and I can create a subcontracting order for it.
> …
> But another type of item code is a structure item, and they are much more complicated for me. I will order our components, but I cannot create the subcontracting PO that would include our components the same way as in the earlier case. The subcontracting does not show on the purchase order list so it will not be ordered unless the sales inform me that this is needed, and then I need to do it manually…I should at least get a copy of the quote from subcontractor to attach to the PO, but this info is now missing.
> (Interviewee 1G, Appendix 1:9)

The interview with purchasing operations pointed out that the methods used on how the complex customized add-on item codes are created to the ERP system effects all the steps that follow it. Depending on the used method, the information on what needs to be purchased from a subcontractor either reaches the purchasing in a documented

way or needs to be handled manually. This confirmed that the methods to work with the ERP system require improvement.

3.4.8 Transporting Items to Subcontractor

After all the needed equipment is available at the warehouse, they need to be transported to the subcontracting. Once again the method of how the items are set in the ERP system effects to the level of required manual interference at this stage. The transportation can be handled at system level only if the ERP system recognizes the item code as such that needs subcontracting.

> If these item codes are set up as "to-be-ordered" from the subcontractor, then the item code itself includes our components, and I can create subcontracting PO for it. This PO then tells our warehouse which items are to be picked and to which subcontractor they are to be sent.
> (Interviewee 1G, Appendix 1:9)

If the system does not recognize the items as such that need subcontracting it again requires manual involvement from the sales to get the items shipped from the warehouse to the subcontractor.

> Structure items… I don't know how the items are shipped to a subcontractor, maybe somebody takes them, or they are shipped by warehouse without papers. I don't know at which point the items are removed from inventory and in which method. I don't know why some of the subcontracted items are created like this. To me, it is just a mess.
> (Interviewee 1G, Appendix 1:9)

> When the goods are shipped from our stock to the subcontractor, I have to arrange it manually because the system does not recognize this procedure. So I need to ask the warehouse to ship the goods using manual documents.
> (Interviewee 1B, Appendix 1:2)

Each time something has to be manually arranged, it causes disruption in the delivery and, according to the interviewees, adds the sense of complication to handle this type of orders.

3.4.9 The Assembly Work Applied by the Subcontractor

When the subcontractor receives the goods, he can apply his assembly and installation work to them. The information on what the subcontractor needs to do to the delivered

equipment is needed to ensure a smooth and uninterrupted delivery of the subcontracting. Otherwise, the subcontractor may not have the knowledge of what exactly is expected to be done, and it causes a disturbance in the workflow.

> Also, there can be instructions included in the item information description for the subcontractor so that he knows what he should do with the items. If this information is missing, then I get enquiries from a subcontractor for more details, and I need to chase this info from sales.
> (Interviewee 1G, Appendix 1:9)

In general, the agreement of the subcontracting delivery was reached at the time the customer quote was prepared as described in section 3.4.3 but the information should follow the equipment to avoid interruptions. This step also traces to the step where the sales order was entered into the ERP system and especially the methods used to request the item codes. The only way to ensure that the goods and the information of what is required to be done to the goods reaches the subcontractor is that the information is available for the purchaser to deliver.

3.4.10 Additional In-House Customization

When the subcontractor has made the agreed assembly for the goods, he ships the finished goods back to the case company. At this stage, the assembly may require additional customization that is applied to the assembled goods.

> Before the goods are shipped from our warehouse to the customer, I will do some additional marking and checking before they can be shipped.
> (Interviewee 1C, Appendix 1:4)

Currently, this additional configuration or inspection is applied by the responsible sales person. The nature of these additions is type 3a, simple customization that can be applied in-house as described in more detail in section 3.3.

3.4.11 Shipping assembled goods to customer

After the in-house customization is accomplished the goods can be delivered to the customer by the warehouse. From this stage on the delivery follows the normal delivery procedures. The warehouse ships the goods to the customer using the normal methods as they would in the case of non-customized equipment shipment.

3.4.12 Documenting the Delivery

Currently, in the complex customized add-on service delivery cases, the detailed information of what has been delivered to the customer and related documents such as layout and electric drawings are in the position of the responsible sales person and the subcontractor who made the assembly:

> Currently, I have them filed in my own system as paper documents, and some are on the company network drive in the customer records. But there is no common place to store them anywhere.
> (Interviewee 1B, Appendix 1:2)

Currently, there are no commonly agreed methods to store this information in a location where it could be accessed by the other members of the unit. It is identified as a threat to continuity for the future deliveries by the researcher since the information is in danger of becoming unavailable in case of employee turnover or if the subcontractor is not able to provide his services for any reason.

The next section presents the strengths and weaknesses discovered from the interviews which are related to the complex customized add-on service delivery process. The findings are discussed, and the reasoning for the selected direction is established.

3.4.13 Strengths of the Complex Customized Add-On Service Delivery Process

The strengths of the complex customized add-on service delivery process identified by the interviewees were related to the aspects of meeting the customer need better. By extending the offering to the customized add-on service deliveries, the customer business opportunities were stated to be more efficiently captured. The flexibility and the benefits gained from expanding the offering to the customized solution were considered as strengths by all the interviewees. The possibility to use external resources as extension to product offering was considered as a valuable tool:

> The subcontracting enables us to deliver systems that we could not otherwise deliver, so it offers a low-cost option to expand our offering
> (Interviewee 1B, Appendix 1:2)

The relationship with the customer was considered to improve when the customer is provided with customized solution instead of standard products. Also, the customer understanding increases simultaneously:

> The connection to the customer is strong, and the knowledge of customer and his operating environment is improved.
> (Interviewee 1C, Appendix 1:4)

The ability to deliver customized add-on service was also considered as an effective element to differentiate from the competition is the eyes of the customer. This ability was considered as a valuable asset when competing in the market:

> The possibility to offer more than a single component differentiates from the component suppliers.
> (Interviewee 1E, Appendix 1:7)

According to the interviewees, a strength related to the building of the customer relations is that the customers give higher value to a supplier who is willing to be flexible in the scope of delivery. This valuation, according to the interviewees, has a potential to generate additional business with the customer:

> It also supports the sales of the bulk components which are highly competed and difficult to make differentiation otherwise.
> (Interviewee 1D, Appendix 1:6)

Therefore, the supplier's flexibility in delivering the customized add-on services has the potential to create indirect competitive advantage which has the potential to affect the customer's decision making also related to the standard products.

The next section summarizes the strengths and the weaknesses discovered within the current add-on service delivery procedures.

3.4.14 Summary of Strengths and Weaknesses

This section presents the found strengths and weaknesses in one collection which are presented in Table 7. The discovered strengths listed in Table 7 are marked with light green color. The strengths are not listed in any particular order. The strengths are all related to the sales perspective highlighting the outcome of the customized add-on service delivery instead of finding strengths from the process steps themselves. The strengths highlight the benefits gained from delivering add-on services to the customer,

and they are valuable information as such because they indicate that there are plenty of positive experiences amongst the personnel who deliver these services to their customers. Therefore, the outcome of this thesis, the improved add-on service delivery process, has to involve the sense of these experiences to preserve the customer-oriented approach to the delivery.

The weaknesses listed in Table 7 include a coloring system which separates the found weaknesses into three groups. Each of the three groups is highlighted with light red color, and they have a red border which circles them. The order of the grouping is presented in the linear way to present their relative position in the delivery process. The first group consists of one item and it is related to the current method that the assembly work is enquired from the supplier. This weakness does not have a direct impact on the add-on service delivery procedures itself from the sales point of view, but it influences the organization's ability to maintain accurate documentation storage as will be discussed in more detail in section 3.5. This weakness did not emerge from the first interviews but only later during the mapping process, and it was confirmed during a check-up interview as documented in section 2.3.

The second group consists of three items which are all marked with an asterisk (*). These weaknesses are all related to the internal processing of the sales order containing add-on service delivery. They were all direct findings from the interviews.

The third group of the weaknesses is the lack of a systematic method to store the documentation for the delivered customized add-on services. This weakness emerged partially at the interview stage and was later confirmed by an additional interview as documented in section 2.3.

Table 7. The strengths and weaknesses discovered in the CSA

Strengths		**Identified in section**
	Increases customer commitment	3.4.13
	Differentiation from competitors	3.4.13
	Use of subcontracting enables low-cost method to offer customization	3.4.13
	Supports the sales of standard products	3.4.13
Weaknesses, areas for improvement		
1	Subcontracting is enquired without accurate specifications	3.4.3
	Each sales person uses different subcontractor	3.4.3
	Common knowledge of other subcontractors used within organization is missing	3.4.3
2 *	Order entry procedures are experienced as unclear and confusing	3.4.6
2 *	Information flow breaks between sales, purchasing, and warehouse	3.4.7
2 *	Order fulfillment is experienced to require manual follow-up	3.4.8
3	No common systematic method to store the delivered system details	3.4.12
"*" in the prefix indicates a common nominator for the weaknesses		

Analyzing further the group 2 weaknesses captured from the interviews shows that the cause for all these weaknesses is in the practices used with the ERP system in processing the order fulfillment and tasks related to it.

The interviews revealed that there is a method in the current ERP system which is intended to be used to handle the orders which include subcontracting, such as the complex customized add-on service deliveries, but it is not in common use. By using the preferred method, all the three weaknesses named as group 2 in Table 7 could be taken under control.

The reason is that all the three weaknesses of the group 2, the sense of unclear procedures to enter the order, the breaks in the information flow between stakeholders and the need for manual involvement in various steps of the order fulfillment are expressed by the interviewees who did not use the preferred ERP method. The interviewees, who did use it, did not report this type of issues. The reasoning for the common nominator of the group 2 weaknesses is presented in Table 8.

Table 8. The common nominator of group 2 weaknesses

Weakness group 2	Root Cause	Common nominator
Order entry procedures are experienced as unclear and confusing	ERP system usage methods are incorrect	Varying methods to work with the ERP system
Information flow breaks between sales, purchasing, and warehouse	ERP system is not used fully to contain needed information	
Order fulfillment is experienced to require manual follow-up	ERP system is not used fully to contain needed information	

As presented in Table 8, the common nominator for weaknesses of group 2, introduced in Table 7, is the “varying methods to work with the ERP system”. This is considered as the main finding and is discussed further is the next section.

The weaknesses listed in Table 7 also include two items which are not categorized, and they both are related to the practices of arranging the subcontracting. The interviews pointed that all the interviewees’ use different subcontractors but at the same time they were not aware of the subcontractors used by others. These can be identified as a weakness but at the same time, it may be the solution for organizing the as the knowledge of the subcontractors is shared between the stakeholders.

As a summary, the main findings indicate Group 1 and Group 3 as weaknesses, as presented in Table 7. Group 2 root cause is analyzed and presented in Table 8. The weaknesses identified in this section and their impact on the process flow is discussed in the next section. The next section also pinpoints the location of these issues in the full add-on service delivery process.

3.5 Main Findings from Analyzing the Customized Add-on Services

The complex customized add-on service delivery process is presented from start to finish in Figure 5. The service delivery starts from the presales stage and ends with the delivery of the customized solution. The numbering in each step indicates to a subsection where the step is discussed in detail in section 3.4, and the coloring follows the same as earlier logic, where the light blue steps indicate that there were no specific issues detected, the red colored step indicates that there were identified weaknesses. As presented in Figure 5, there were three main steps which have a major effect on multiple other stages and accordingly, on the whole, delivery process.

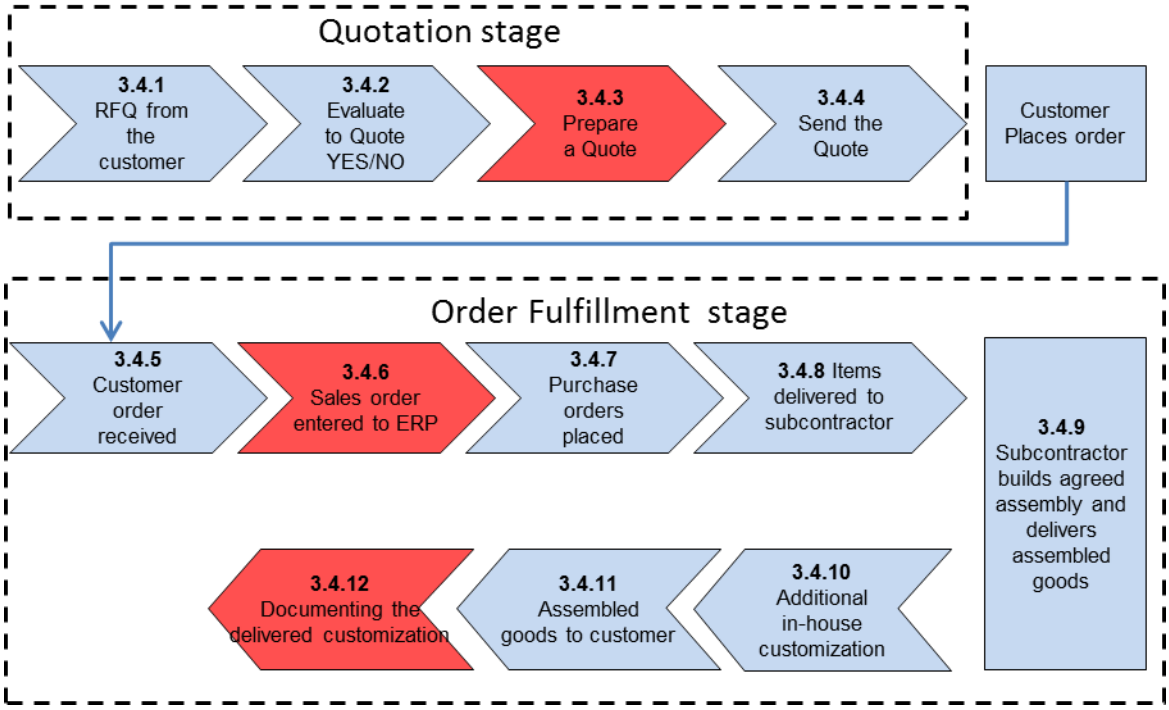

Figure 5. Complex customized add-on service delivery process from the presales to the order fulfillment

The first step with an impact on the delivery as a whole is the step which takes place already at the presales stage. This step includes the enquiry for subcontracting which is currently done without a unified specification for the scope of delivery concerning the technical documentation as described in section 3.4.3. The nature of the whole add-on service delivery process is so that the customer quotation continues to the order fulfillment only after the customer places the purchase order. Therefore, the specified scope of delivery becomes an issue only if the customer decides to place the order according to the quotation. The reason is that the scope of delivery which is agreed with a subcontractor in the presales stage ends up being purchased as described in section 3.4.7.

The second step with large impact is the methods and practices used when entering the new order to the ERP system as described in section 3.4.6. The selected method effects on all the steps that follow it in the order fulfillment process and therefore it has the largest single effect of the three main findings. The third step with large effect is the practices of how the technical documentation of the deliveries is handled as described in section 3.4.12. It does not have a direct impact on the delivery itself, but it has a large effect on the case unit's capability to continue the deliveries for the repetitive or-

ders, and it also impacts the case unit's capability to recover from disturbances such as changes in the personnel or subcontractors.

These three identified main findings recognized from Data 1 collection from different steps of the complex customized add-on service delivery process are presented with their business impact in Table 9. The numbering in parentheses after each identified finding relates to the section where they are discussed in detail.

Table 9. Main findings from the complex customized add-on service delivery process

No	Identified finding	Impact on process flow
1	Subcontracting is enquired without accurate specifications. (3.4.3)	Vague specification at the enquiry stage increases cost at the delivery stage.
2	Varying methods to work with the ERP system. (3.4.6)	Incorrect methods cause disturbances to the flow of goods and increases the need for manual interference of stakeholders
3	No common systematic method to store the delivered system details. (3.4.12.)	Lack of accessible technical documentation endangers the long-term continuity to deliver the agreed customizations.

The main findings from the CSA, as presented in Table 9, show that the complex customized add-on service delivery process lacks consistency in between the key stakeholders. The reasons for behind this were not investigated deeper, but they are suspected to derive from the lack of written process description.

All the three main findings influence on the add-on service delivery process and, therefore, they all are considered as required to be resolved in the new service process. To improve the first identified main finding, the specifying of the scope of delivery, the best practices for purchasing and purchase specifications is studied. To tackle the second main finding, the harmonization of the methods used to work with the ERP, the best practices for knowledge transfer is studied. And for the third main finding, the lack of a common method to store the delivered system details, the best practices for knowledge sharing is studied.

Therefore, this thesis looks in section 4 for best practices from the existing knowledge for purchasing practices and knowledge management to build a Conceptual Framework for the add-on service delivery process.

4 Best Practices for Add-on Service Delivery Process

This section looks at the existing knowledge on how to handle the main findings discovered in the Current State Analysis concerning the complex customized add-on service delivery. The best practices are related to purchasing procedures and knowledge management in the area of transferring and sharing knowledge.

4.1 Delivering Customized Add-On Product Services

Benton (2014) identifies two alternatives for a company to compete in the market. These alternatives for a company are to find competitive advantage from cost management, or another option is that the company is able to differentiate itself from the competition. Benton (2014) continues that the low-cost strategy as a driver requires typically standardized mass production with less flexibility to respond to customer demand where continuous process. The differentiation from competitors targets to offer more flexibility and options to the customer to meet the customer need.

One element of differentiation for a producing company is to provide services which support the customer and customer's competitive position. Aurich et al. (2010) state that for example increasing market saturation and competition are reducing the possibilities to differentiate from competitors with products, and this drives the focus on additional innovative services. With the focus shifting from products to the services, it also shifts the selling perspective from product sales into selling the value to the customer (Meier et al., 2010). Meier et al. (2010) discuss industrial product-service systems which are systems where original equipment manufacturers' (OEM) scope of supply is not the products at all, but instead it is the usability of the delivered system that is being delivered.

This thesis observes the add-on services from a perspective of an equipment sales organization which is focused on delivering equipment to OEM customers and in this scope can act as a facilitator of an industrial product-service system for its customers. In this context the add-on services are embedded in the physical products and the ownership of the products including the add-on service is transferred to the customer. Since the organization does not have existing production capabilities, the services, and the equipment offering is built in cooperation with external resources. Therefore, the best practices for purchasing products and services are viewed in the next section.

4.2 Purchasing Subcontracted Assemblies

Purchasing in a business-to-business environment is an operation which is typically handled in an organization by dedicated purchasers. Purchasing can be seen as supporting internal operation within the company which ensures that the day-to-day business can continue without interruptions. The purchasing function provides the needed raw materials and services using a variety of suppliers. The need to purchase something emerges from the business need, often from a situation that the company has itself received an order to deliver something from the offering.

To view purchasing as an act where a purchase order is sent to a supplier who then delivers the ordered goods in return is inspecting only the operative function, namely the ordering part of the whole entity. Until the purchaser can proceed to the operative function of sending the purchase order, there has to have been preceding steps in which is decided what is going to be purchased and from where it can be obtained. Weele (2010) presents a process model for purchasing which is shown in a simplified version in Figure 6. The process model presents purchasing as an internal service for the internal customer.

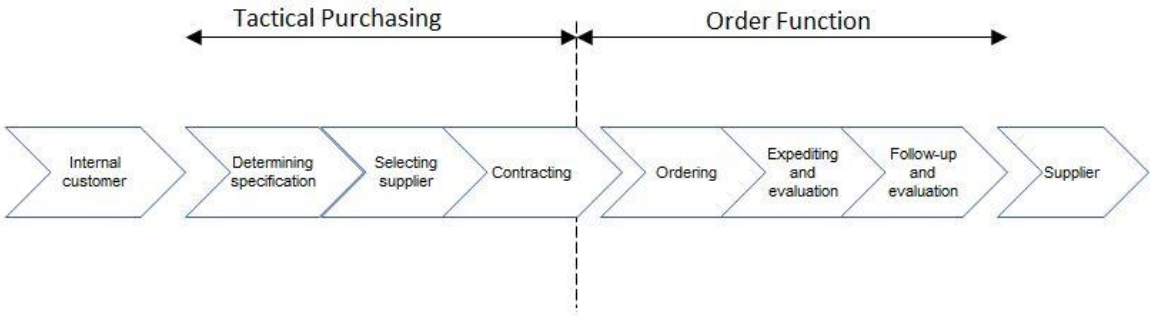

Figure 6. Purchasing process model, edited from Weele (2010:9)

The purchasing process model, presented in Figure 6, names the steps preceding the actual ordering as tactical purchasing. Tactical purchasing consists of three elements which are, determining the specification for the purchase, selecting a supplier and making a contract with the supplier.

Determining the specification is an important task which reflects the whole outcome of the purchasing case. Leenders et al. (2002) state that the internal customer has to accurately describe the scope of the purchase and that the purchasing, with the internal customer have a mutual responsibility to describe the need in suitable accuracy.

Both too vague and too detailed specifications lead to the undesired outcome. The more complex is the purchased the item or service, the greater the need for accurate specifications.

After determining the specification, the next step is to select a suitable supplier to for the requested product or service. Johnston et al. (2012) state that supplier selection criteria should not be based merely on cost and technical quality but also other aspects, such as financial status of the supplier, suppliers aspect of quality management and suppliers focus on continuous improvements, as well as shared values are to be considered. Final third step after selecting a supplier is to make a supply agreement which defines the price and other terms such as payment agreed a delivery time and defined responsibilities of both parties in case of exceptions.

After the agreement with the supplier has been reached, the purchasing can proceed to order function, as described in Figure 6. The first step of the order function is the sending of the purchase order which identifies the items or services that are ordered. Purchase order also may include a request to the supplier to confirm the order. The purchasing can then compare to ensure it meets the agreement. After the order is placed, the purchasing moves to next step which is the expediting of the order. Weele (2010) argues that the purchaser is better to use the preventive approach in expediting by checking with the supplier in advance whether the delivery is on schedule. Otherwise, it may occur that the internal customer informs that the delivery has not arrived in time which then requires immediate reacting and chasing the order. Also, this leaves no time to prepare to the occurrence. Weele (2010) argues that especially in critical purchases and with critical suppliers a useful method is to follow up on the progress of the delivery by scheduled intervals and possibly visiting the supplier premises to ensure the progress. The third and final step of order function is the follow up of the delivery after it has been received according to the original agreement. Weele (2010) continues that this step includes possible warranty claims and also the administering of the documentation related to the delivery. The experiences gathered through the whole process would be important to collect as they can be used in the future as a source when selecting the supplier for a new delivery.

Make-or-buy decision

The steps described in the purchasing process model in Figure 6 emerge from the business need of the internal customer. When a company recognizes a need for a new

type of product or service in its business, it has to decide what would be the most suitable method to accomplish the required task. The company has options to either to produce the needed product or service by itself or it can decide that it will be acquired from a supplier. This decision is called make-or-buy (Benton, 2014; Leenders et al., 2002). Leenders et al. (2002) discuss that make-or-buy interlinks directly to outsourcing, and an increasing number of companies have opted to use outsourcing. With outsourcing their target is to increase competence in the global market and to reduce the costs. Outsourcing is also an option for the companies to focus on their core operations and competencies.

Benton (2014) states that the company making the make-or-buy decision has to specify what service or product the decision concerns and what is the company's current ability to produce the required product or service using its internal resources. The decision to buy from an external source instead of producing in-house is an important strategic decision. It may have a great impact on the company's overall performance in either good or bad. The outsourcing decision may damage the company for example in a situation where the company decides to focus on its core competencies by outsourcing but fails to detect what those competencies truly are.

Summing up this section on purchasing, the best practices emphasize that the purchasing is a strategic function which has a high impact on the company's operative capability. Before purchasing as an operative function can take place, there is the element of tactical purchasing to specify the most suitable supplier as well as specify the scope of delivery. The more complex the object of the purchase is the more attention is needed in specifying the scope. A well-organized purchasing enables the organization efficiently use also external resources as an element of gaining competitive advantage.

The next section discusses best practices in Knowledge Management literature for transferring and sharing knowledge within an organization. The section views the definition and nature of knowledge as well as organizational aspects in knowledge sharing and transferring.

4.3 Establishing Practices for Knowledge Sharing and Transfer

In the contemporary business literature, knowledge is stated as a critical resource for companies in their pursuit of competitiveness in the business environment. Knowledge

of the employees enables them to accomplish their work and apply suitable methods to different situations. The knowledge workers work with ideas, information and knowledge to add value to the company (Jashapara, 2010)

In the Knowledge Management (KM) literature the differentiation between *data*, *information* and *knowledge* are made to note that they are not equal and, therefore, should not be treated equally. Davenport and Prusak (1998) define *data* as a set of facts and unprocessed raw figures. Jashapara (2011) elaborates that definition by stating that data can be qualitative or quantitative by nature. The quantitative data can be presented as figures whereas qualitative data is not as exact and has more space for interpretation. Davenport and Prusak (1998) describe *information* as a message which is passed from a sender and a receiver in the form of a document or audible or visible format. Davenport and Prusak (1998) state that although information is a form of processed data the receiver is the one who determines whether the data includes any information. Alavi and Leidner (2001) state that a vast amount of information as such has only little value for an individual but information that is being actively processed in individual's mind through for example learning may be useful.

Davenport and Prusak (1998) define knowledge as follows:

> Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of the knowers. In organizations, it often becomes embedded with not only in documents or repositories but also in organizational routines, processes, practices, and norms. (Davenport and Prusak, 1998:5)

As can be noted from the definition by Davenport and Prusak (1998), knowledge is not a simple issue even to define since it is cultivated in the minds of the individuals in numerous ways. In the contemporary business literature, knowledge is separated into two main categories, and they are, tacit knowledge, which exists only within the knowers mind and explicit knowledge which can be presented in a documented form.

Burlton (2001) defines knowledge in a business context as a guide which helps individuals to make judgments and decisions and as a source which enables working altogether. Burlton (2001) describes knowledge management as a set of processes and practices which increase organization's capabilities as well as abilities to share the in-

dividual knowledge to others. Burlton (2001) describes knowledge through life cycle diagram as presented in Figure 7.

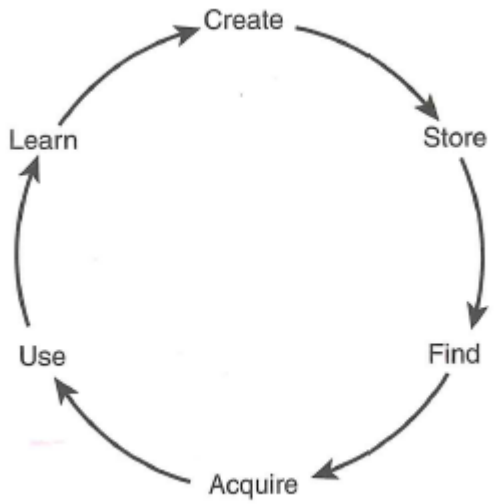

Figure 7. Knowledge life cycle (Burlton, 2001:77)

Burlton's knowledge life cycle, as presented in Figure 7, starts from the top with the creation of knowledge, which may have a source within the organization or can be extracted from an external source. This new knowledge is then stored in some method for it to become accessible for others to find. Those who need the knowledge must figure out a way to find the knowledge and also get access to the knowledge in a suitable way. The finding may require searching places or enquiring from correct individuals. Once the source of the knowledge is found, the individual pursuing the knowledge must transfer it from the source to personal knowledge. Only after the transfer stage, the new knowledge can be put to use. The final step of the knowledge life cycle circle in Figure 7 is the learning which occurs when the new knowledge is used, and those experiences are linked back to the source to shape or update the existing knowledge as a process of continuous improvement.

Burlton (2001) highlights the importance of controlling the life cycle in means that the best knowledge can be applied to use as efficiently as possible in without unnecessary delays. One prospect to make the life cycle quicker is to highlight the element of knowledge sharing since it as such does not exist in the life cycle model.

Knowledge Sharing

Knowledge sharing from a managerial perspective is not just a matter of implementing some selected technology. Since the knowledge, or, at least, part of it, is in the minds of the knowers, it can only be accessed through the knower's cooperation. Knowledge is built with noticeable effort and, consequently, is not automatically subject to sharing even if asked for. Davenport (2005) states that knowledge sharing is not easily achieved since knowledge of the knowledge worker is their most valuable asset. Therefore, for example, the rising trend of outsourcing operations is very likely to influence the will of the workers to share their insights. In an organization where knowledge sharing culture does not exist, the knowledge is kept at the individual's position either as tacit knowledge or as explicit knowledge which is not accessible by others.

The organization needs to be able to motivate individuals to share what their knowledge. Buckman (2004) states that this can be achieved by starting to build trust within the organization. The employees need to be able to trust their employer and also to each other. Buckman (2004) continues that employees need to sense that they are treated equally and justifiably. The company's statement of values needs to be continuously the guideline for decisions at all levels and situations.

When the organization has the ability and will to share information, the organization can start practicing the knowledge sharing. Hau et al. (2013) state that knowledge sharing is dependent on the form of the knowledge since for example explicit knowledge can be communicated in a documented form but tacit knowledge may not necessarily be as easily communicated as it is experience-based know-how or practiced skills. This makes tacit knowledge more complex to be shared among individuals.

Knowledge transfer

As presented in knowledge life cycle in Figure 7, the challenge of the knowledge transfer is how to distribute knowledge within the organization so that it is accessible to the people needing it as well as presented in a form that it can be transferred to persons own knowledge efficiently. From individual's perspective, the challenge is the opposite as how to find the source of the knowledge. Some form of knowledge transfer takes place whenever individuals communicate with each other. As Davenport and Prusak (1998) state, individuals communicate with each other whether it is managed or not, so

the knowledge transfer also takes place whether it is managed or not. Davenport and Prusak (1998) state that the best way to handle knowledge transfer in an organization would be to allow people to have the possibility to communicate with each other on topics related to their work. In this perspective, it would be the company's responsibility to facilitate the knowledge transfer to occur by arranging these opportunities.

Davenport and Prusak (1998) give an example of a situation where a person needs new knowledge but does not know where to get access to it. Typically he or she would search for company's internal resources for the answer or would contact some colleague for advice. These hallway discussions or similar situations may produce the knowledge transfer, but at best it remains between the participants, even though the knowledge could be valuable for a larger number of people. But since the nature of the transfer is unofficial, the others will not have the chance to find the source of knowledge. Or, in the worst case, since the source of knowledge is unofficial, there is the possibility that the transferred knowledge is not accurate, or it could be even false.

Davenport and Prusak (1998) highlight that for knowledge transfer to be successful, a mutual language between the participating individuals in highly important. Their implication to language does not limit to the actual spoken language like English or such but goes beyond to the so-called professional language. When transferring professional knowledge, all the participants need to have the same meaning for the words and expressions that are used. Otherwise, there is a risk that the knowledge transfer is only a partial success, or could even result in a complete failure.

Summing up this section on knowledge sharing and transfer, the current literature on knowledge emphasizes that knowledge is a critical resource for companies. The knowledge can exist in multiple forms, for example as tacit or explicit knowledge. For a company to gain from the knowledge within the organization, both sharing and efficient transferring of knowledge is required. The best practices point out that in knowledge sharing the human nature is strongly involved, especially in sharing tacit knowledge. The explicit knowledge is easier to share, but it as well requires that the person who possesses the knowledge trusts the organization and is willing to share. The knowledge transfer views the topic more from the receiving perspective and highlights the importance of letting the opportunities to take place where the knowledge can be transferred. By focusing on transferring the knowledge on work practices, the organization can decrease the unofficial and possibly incorrect practices from being used.

The next section presents the Conceptual Framework of this thesis based on the best practices discussed in this and the previous section.

4.4 Conceptual Framework

This section summarizes the best practices studied for purchasing, knowledge management and knowledge transfer as the Conceptual Framework of this thesis. The objective of this thesis is to improve the new add-on service delivery process of the case unit, and therefore, the Conceptual Framework is presented as a linear process which starts from the left side of the picture and proceeds to the right as presented in Figure 8. The studied best practices are placed into the framework to applicable positions to link together the best practices and the findings from the CSA, which was discussed in section 3.

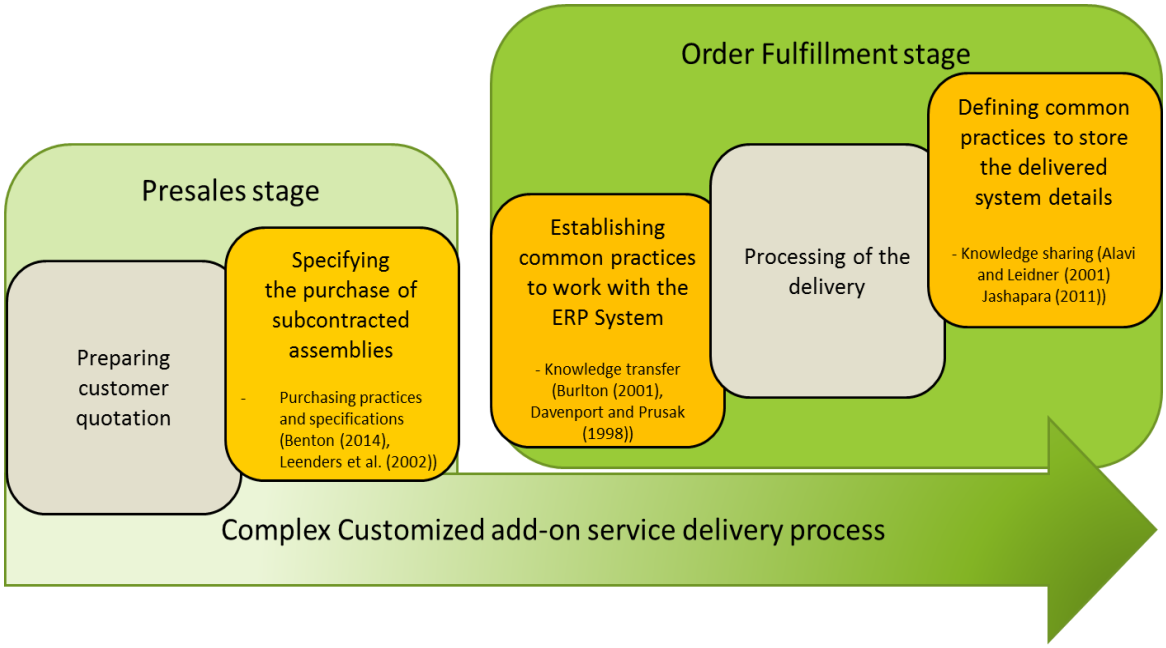

Figure 8. Conceptual Framework for add-on service delivery process

The Conceptual Framework, presented in Figure 8, describes the add-on service delivery in a simplified form using colors to identify the sub-elements to which the improvements are searched for. The gray color in the Figure 8 sub-elements identifies the elements which do not require any particular improvement, as the orange color in the sub-elements recognizes the need for further improvement. The Conceptual Framework links together the current complex customized add-on service delivery procedures with the main findings from the CSA and with the studied best practices.

The Conceptual Framework is divided into two main elements which are named Presales stage and Order fulfillment stage as presented in Figure 8. The Presales stage includes the operations to prepare the customer quotation. The complex customized add-on service delivery requires the use of external resources since there are no suitable resources available in-house. Therefore, the purchasing practices were studied to specify the scope of delivery in the suitable accuracy level to avoid surprises at the later stages.

After the presales stage is completed, the add-on service delivery process proceeds to the second main element, which is the order fulfillment stage. The order fulfillment stage, as presented in Figure 8, has two elements which need to be improved. The first element which needs improvement is the procedures related to the methods used to work with the ERP system when delivering add-on services. In the search for tools to improving them, the knowledge transfer literature was reviewed to capture ideas how to facilitate the case unit with the knowledge on procedures which would become commonly accepted and used. The second sub-element in order fulfillment stage, which needs further improvement, is how the documentation is stored in the case unit data storages for it to be accessible for other members of the unit. The ideas for improvement were studied from the knowledge sharing literature.

With the Conceptual Framework for add-on service delivery process now complete, this thesis moves on to building the draft proposal for improved add-on service delivery process.

5 Building a Proposal for Add-on Service Delivery Process for the Case Unit

This section discusses the building of the proposal for an improved add-on service delivery process for the case unit. The draft proposal is built one step at a time and finally the complete proposal is presented at the end of this section. The target for building the proposal is to create a new process for add-on service delivery for the case unit.

5.1 Overview of Building the Proposal

The proposal for an improved add-on service delivery process was built in cooperation with the stakeholders of the case unit. The data collected from the draft proposal building was documented as Data 2. The selected method to collect the data from the stakeholders was to conduct workshops in small groups. The participants were selected for the data collection workshops by their anticipated willingness to contribute to the proposal building, evaluated solely by the researcher.

The workshops were arranged in April 2016. All the workshops were conducted in an identical setup where first the initial proposal was presented step by step to the participants as a basis for the discussion, and then space was given to the stakeholders for ideas, improvements and further discussion to take place. The initial proposals were presented to set the focus to the detected areas needing for further improvement as identified in the CSA. This turned out to be effective since valuable contribution was received from the participants on figuring out the most suitable methods to improve the add-on service delivery process.

As documented in Section 3, the CSA revealed three main weaknesses which are in need for further development. The three weaknesses are the purchasing practices of subcontracting, the varying methods to work with the ERP system and the lack of a systematic method to store the details of delivered systems. The whole add-on service delivery process consists of two stages, the presales stage and the order fulfillment stage as presented in Section 3, Figure 2 on page 15.

Of the identified weaknesses, the first one, the purchasing practices of subcontracting begins in the presales stage when subcontracting is enquired from the subcontractor. The two latter ones, the varying methods to work with the ERP system and the lack of

a systematic method to store the details of delivered systems, occur in the order fulfillment stage. The same logic was used to structure this building of the proposal. At first, the whole add-on delivery process was divided into the two stages and then each stage was discussed in detail in its own section. The order fulfillment stage was further divided into two subsections to get to improve one identified weakness from CSA per one section.

The draft proposal was built by combining Data 1, which indicated *what* needs to be improved and the Conceptual Framework which showed *how* the improvements can be achieved. Then Data 2 brought the practical insight on *how* the improvements can be applied to the operational level within the case unit.

The next section discusses the first identified weakness, the purchasing of the subcontracting by presenting the presales stage of the process and by focusing on the step when subcontracting is first enquired.

5.2 Purchasing Subcontracted Assemblies

The first area of further development is to specify how the scope of delivery in subcontracting needs be defined when it is enquired. The enquiry for the subcontracting is a part of the presales stage since the subcontracting is a part of the total customer delivery and therefore needs to be resolved before customer quotation can be presented. Although the act of purchasing will occur only later at order fulfillment stage, the scope of delivery needs to be defined when the customer quotation is prepared. As the best practices from the literature suggest, the company making a purchase needs to make detailed specifications of the scope of delivery for the subcontractor to prevent misunderstandings and interpretations in the delivery. The workshops with the stakeholders focused therefore on this particular area of the presales stage to capture the suggestions and the ideas of how to improve the defining of the scope.

The steps included in the presales stage are presented in Figure 9 and are discussed step by step from the start till the end starting from the next paragraph. The step which requires the most focus, the specifying the scope of subcontracting, is highlighted with orange outlining in Figure 9. The related improvement ideas captured in the workshops are presented as a summary in Table 10.

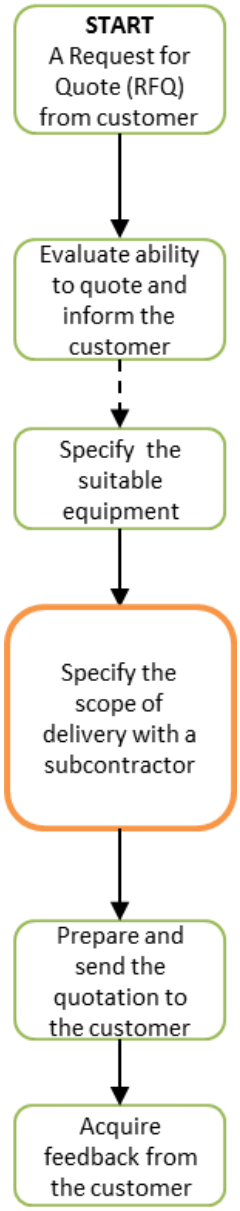

Figure 9. The steps included in the presales stage of the add-on service delivery

The steps included in the presales stage of the add-on service delivery discussed step-by-step:

A request for quote (RFQ) from customer

The presales stage of the add-on service delivery process starts when a request for quote (RFQ) is received from the customer.

Evaluate ability to quote and inform the customer

The first step of action starts when the RFQ from the customer is received, and the responsible sales person decides, based on the commercial and the technical perspectives, whether the quotation is reasonable to prepare. This decision is communicated to the customer. If the decision is not to quote, the process will be terminated here.

Specify the suitable equipment

When the decision to quote is reached, the responsible sales person starts to prepare the quote by specifying the suitable equipment for the proposal. The equipment has to fulfill the requirements of functionality from the customer.

Specify the scope of delivery with a subcontractor

After the equipment which will be part of the customer, the quotation is specified the responsible sales person will contact a subcontractor who is capable of providing the needed additional assembly work. The first focus point of the workshops was to collect ideas and requirements on how the scope of delivery should be specified in the appropriate level of detail. The field notes from the workshops are documented in Appendix 2. The ideas for specifying the scope of delivery were related to both the format and the context of the subcontractor quote:

> The subcontractor should be asked to quote in written format which identifies the project it is related to and the accessory components that are included in the quote.
> (Workshop 2A, Appendix 2:1)

> The enquiry to the subcontractor should be made in a written format which states the scope of delivery which also includes the layout drawings, part lists and electrical drawings in case it is delivered.
> (Workshop 2B, Appendix 2:2)

> These documents should be requested in both electrical format (pdf) as well as paper copies which follow the assemblies to the customer.
> (Workshop 2B, Appendix 2:2)

The results of the improvement ideas from the workshops are summarized in Table 10, which specifies the total of three different points for improvement as well how they would be improved.

Table 10. The ideas from workshops to improve the purchasing of the subcontracting

Point No	Point specified	What is requested	When is required	To whom delivered
1	The form of the quote from the subcontractor	The quote in written format, including a detailed list of all parts, included in the delivery.	At presales stage	Electrical format to responsible sales person with a copy to the purchaser
2	The documentation related to the assembly	Layout drawings Part lists Electric drawings	At order fulfillment stage	
3	Form of documentation	To be delivered in printed and electrical form		

The first point to improve as presented in Table 10 is to specify the form of the quotation. The subcontractors are requested to deliver a written quotation which includes the details of the delivery, including accessories. The subcontractor quotation is required at the presales stage of the complex customized add-on delivery and is asked to be delivered to the requesting sales person and as a copy to purchasing personnel.

The second point of improvement is to specify in detail the technical documentation which is required to be included in the delivery. The documentation will be required only if the presales stage proceeds to order fulfillment stage. The third point of improvement from the workshops was to define the format of the documentation. The format was defined to include both electrical and printed versions of the documents. Also, the technical documents are requested to be sent to both sales and purchasing.

With the improvements specified in Table 10, the case unit can ensure that the scope of delivery and the requirements from the subcontractors are unanimous. An additional improvement is that the requirements are decided by the case unit and are not left to the subcontractor to decide.

Prepare and send the quotation to the customer

After the quotation has been received from the subcontractor, the responsible sales person will prepare the complete customer quotation which includes the equipment and the assembly work from the subcontractor. The quotation is created using company ERP system. After the customer quotation is prepared, it is delivered to the customer.

Acquire feedback from the customer

After the quotation is sent to the customer, the responsible is in contact with the customer to find out whether the customer need was met with the quotation.

The presales stage of the complex customized add-on service delivery ends with receiving the feedback from the customer. With the results from the workshops, as summarized in Table 10, the building of the proposal concerning the presales stage of the complex customized add-on service delivery is now completed. Now the building of the proposal can move to the next stage, the order fulfillment stage.

5.3 Establishing Practices for Knowledge Sharing and Transfer

The order fulfillment stage of the complex customized add-on service delivery was identified in the CSA to contain two weaknesses which required further improvement. The first area requiring for improvement is how to establish common practices to work with the company ERP system when handling add-on service delivery sales orders which require subcontracting. The second area requiring improvement in the order fulfillment stage is how to define common practices to store the details of delivered complex customized add-on services. The areas of improvement to the order fulfillment are discussed in separate subsections starting with improving the practices to work with ERP system. The logic to divide the order fulfillment into two is that both areas needing improvement are discussed in their own section with one main focus.

5.3.1 Practices to work with the ERP system

As the CSA revealed, the practices to work with the ERP system vary within the case unit which has a large effect on the whole flow of the add-on delivery process. The methods to work with the ERP system are related to how the item codes are created into the ERP system. The best practices of existing knowledge suggest that the knowledge transfer should be highlighted to ensure each person has the access to the knowledge. The first area of improvement in the order fulfillment stage that the workshops focused on was how to ensure common practices would be used in requesting the item codes to the ERP system.

The steps included in the in the first half of the order fulfillment stage are presented in Figure 10 and are discussed step by step in the next paragraph. The illustration presented in Figure 10 shows how the presales stage, discussed in Section 5.2 and illustrated in Figure 9, is interconnected with the order fulfillment stage. The dashed dot line connecting the two stages illustrates the possible point of interruption. The steps which are part of the presales stage are marked with gray color. The step in first part of the order fulfillment stage which requires improvement, namely the request new item codes, is highlighted with orange outlining in Figure 10 and the related improvement ideas captured in the workshops are presented in Table 11.

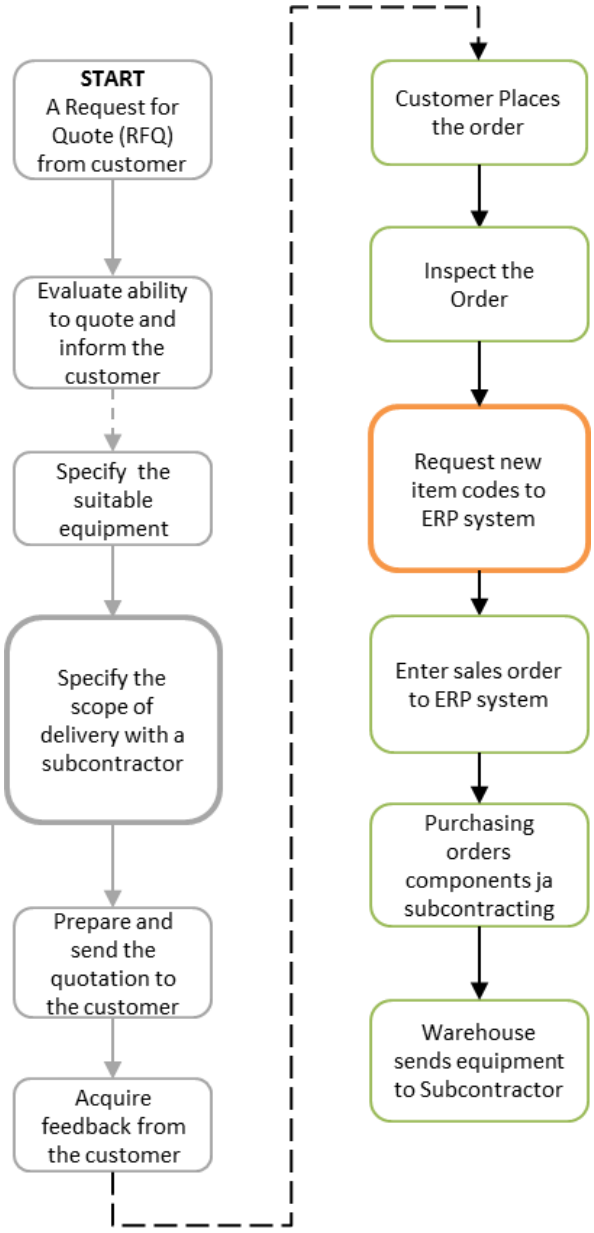

Figure 10. Steps included in the first half of the order fulfillment stage

The steps included in the first half of the order fulfillment stage, as presented in Figure 10 discussed step-by-step:

Customer places the order

The order fulfillment stage of the complex customized add-on service delivery starts when the customer places the order for the quotation which was presented to him at the presales stage.

Inspect the order

When the order is received, the responsible sales person inspects the order and ensures that the scope of delivery and other elements of the order are equivalent to the original customer quotation.

Request new item codes to ERP System

The next step is for the responsible sales person to request new item codes into the ERP system from sales order processing. The item codes are needed so that the sales order can be placed into the ERP system and the delivery process can get started at the system level. The CSA revealed that there are variations in the way the items codes with subcontracting are set to the ERP system, and the reason was discovered that it relates to how they are requested to the ERP system. It then relates directly to the way the sales order is processed at the system level. The CSA, on the other hand, revealed that the ERP system indeed has a method to support the item codes to be subcontracted. Therefore, the main focus of this section was to get ideas from the workshop on how to improve the utilization of the ERP system to ensure it would be used in the intended way:

> All the persons who are making the new item request need to be informed that there is the “subcontracted item type” which must be used. The persons who created the codes and the persons requesting them would need to use same words for the codes to avoid misunderstandings.
> (Workshop 2A, Appendix 2:1)

> The persons making the request have to be specific to identify what they need so that the persons who create the new item codes know what is expected.
> (Workshop 2B, Appendix 2:2)

Table 11. The ideas from workshops to improve the common ERP utilization procedures

Point No	Point specified	With whom?	Why?
1	Internal training and group discussion needed	Responsible sales persons and persons handling the item code requests.	To ensure that all the persons operating with the subcontracting use the same terms and words meaning the same things in the ERP language.

The ideas from the workshop are summarized in Table 11. The ideas can be presented with a single point, and that is to improve the awareness that there is an existing preferred method, called subcontracted item code, to be used in the ERP system when dealing with add-on services. This can be achieved by arranging internal training and group discussions which involve all the participants.

Enter the sales order to the ERP System

The next step is to enter the sales order into the ERP system to get the delivery process started at the system level. By using the preferred methods in the ERP system as described in the previous step, the subcontracted item, the item code will contain the needed information for all the stakeholders to know how to process it.

Purchasing orders components and subcontracting

When the sales order is entered into the system as a subcontracted item, the purchaser will have the knowledge to order the needed equipment and place the order for the subcontracting using the quote from the subcontractor.

Warehouse sends equipment to subcontractor

After the equipment and the subcontracting are purchased, the warehouse can send the equipment to the subcontractor according to the bill of material (BOM) of the subcontracted item.

The first half of the order fulfillment stage ends to the step when the equipment is sent to the subcontractor. As described in the previous steps, the crucial step is to ensure that the subcontracted item is set to the ERP system in the preferred way since it removes the need for anyone to interfere the process manually and all participants can handle their share with knowledge of what is required. The results from the workshop

showed that suitable method to improve the methods to work with the ERP system is to arrange internal training and group discussions with sales personnel and the sales order processing personnel.

Now that the ideas to improve the first half of the order fulfillment stage are captured, the focus can move to the second half. The second half of the order fulfillment stage concentrates to the final area requiring improvement, which is how to make the technical documentation of the deliveries accessible for other users.

5.3.2 Practices to Store the Delivered System Details

The practices to store the documentation related to the delivery were identified in the CSA as the second area of order fulfillment stage which requires improvement. The existing knowledge suggests that methods from knowledge sharing could be used. The form of knowledge is explicit as it is in the form of documents but it needs to be made accessible to others. As the CSA revealed, the documentation related to the deliveries are not stored in a systematic method into a location where they would be accessible. Therefore, the workshops focused on capturing the ideas on how to improve the access to the documentation.

The steps included in the second half of the order fulfillment stage are presented in Figure 11 and are discussed step by step in the next paragraph. The step requiring the most focus, which is the method to make the technical documentation available, is highlighted with orange outlining in Figure 11 and the related improvement ideas captured in the workshops are presented in Table 12.

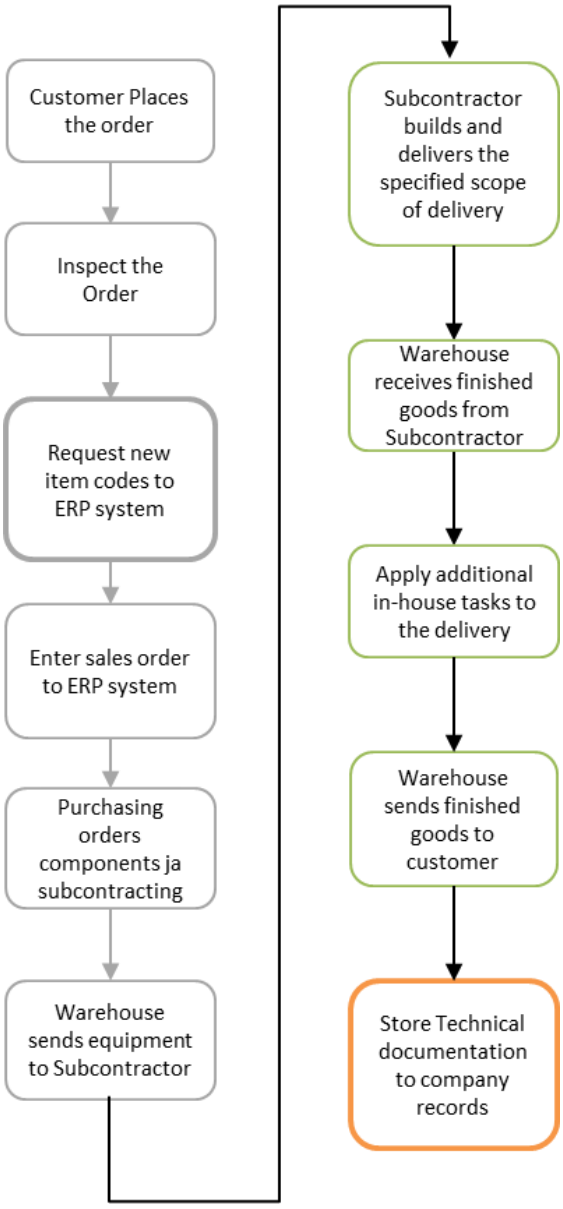

Figure 11. Steps included in the second half of the order fulfillment stage

The steps included in the second half of the order fulfillment stage are discussed step-by-step below.

Subcontractor builds and delivers the specified scope of delivery

The second half of the order fulfillment stage continues directly from the first half with the subcontractor building the ordered assembly with agreed documentation. After the subcontractor has finished with the assembly, he will deliver the finished goods with the method agreed in the purchase order.

Warehouse receives the finished goods from subcontractor

After the subcontractor delivers the finished goods, the warehouse receives them in the ERP system. If the items are not delivered immediately or if they are stocked items, they will be placed in stock location.

Apply additional in-house tasks to the delivery

The responsible sales person ensures that additional tasks, which are not included in the subcontractor's scope, are applied to the delivery if needed. This information needs to be included in the ERP system. Otherwise, the goods may be shipped to the customer before the additional tasks are applied.

Warehouse sends finished goods to customer

After the goods are in received to the ERP system, they are available to be delivered to the customer. The delivery to the customer follows the original sales order delivery dates.

Store Technical documentation to company records

After the system has been delivered to the customer, the technical documents related to the delivery need to be made available to ensure the continuity of the deliveries in the future. The systematic method to handle the documentation storage is currently missing within the organization, and the third, and final focus of the workshops was to capture ideas on how the accessibility of the documentation could be improved. The ideas from the workshops were captured to figure out the most suitable accessible location for the documentation as well as the person who is responsible for making the documentation available:

> The ERP enables saving documentation linked directly to the item code to ERP, this would be the preferred location.
> (Workshop 2A, Appendix 2:1)
>
> The documentation should be saved by the responsible sales person, but purchasing could do it as a backup if the documentation is sent to purchasing as requested in the original enquiry.
> (Workshop 2B, Appendix 2:1)

Table 12. The ideas from workshops to improve the accessibility of the technical documentation

Point No	Point specified	Where to?	By whom?
1	Location to store delivery related documentation	The related technical documents are to be stored in the ERP system with link to item code	Responsible sales person ensures that the documents are stored. Purchasing acts as a backup.

The ideas from the workshop are summarized in Table 12. The ideas can be presented in a single point, and that is how to ensure the documentation related to the delivery is stored into a location where it is accessible to others. As presented in Table 12, the most suitable location is directly in the ERP system linked to the subcontracted item code. The person who handles the saving of the documentation is the responsible sales person. Purchasing can act as a backup which requires that the documentation has to be at purchasing's disposal as requested in the enquiry for original subcontracting as described in Table 10.

Now improvement ideas to all the three weaknesses identified from the CSA have been captured from the workshops. The building of the proposal can move to implementing the ideas into the draft proposal of the add-on service delivery process which is presented next as a complete process.

5.4 Draft Proposal for the Add-on Service Delivery Process

This section presents the complex customized add-on service delivery as steps which are required to deliver the requested services. The process is presented as a whole from the starting point to the finish in Figure 12. As presented in Figure 12, the process consists of two main stages, which are the presales stage and the order fulfillment stage. The process begins with the presales stage and proceeds from presales to order fulfillment only after the customer decides to place an order for the quoted add-on service.

The results gathered from the workshops to improve the three identified areas are applied to the illustration and are emphasized with a thick green outlining. Each step of the whole process was discussed in detail in previous sections 5.2 and 5.3 including the improvement ideas from the workshops.

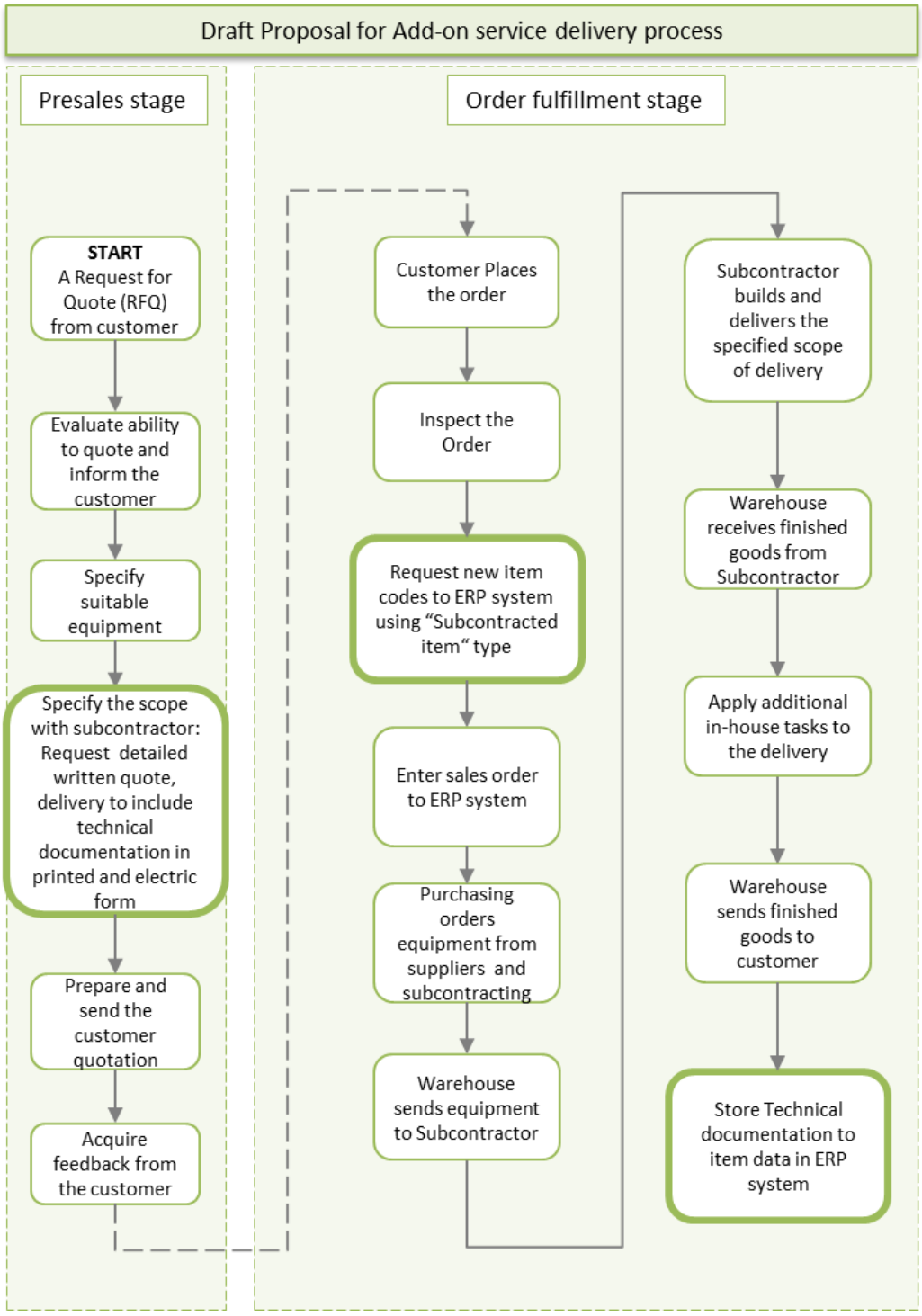

Figure 12. The Draft proposal for add-on service delivery process

As presented in Figure 12, the draft proposal for add-on service delivery process progresses in linear form, step-by-step, starting from the presales stage. The presales stage is presented to have an end point in the step when the feedback is acquired from the customer to the quoted proposal. As the continuity of the process is no longer in the hands of the case unit, but it depends on the customer decision, the presales stage and the order fulfillment stage are connected with a dashed dot line to point out this

possible interruption of the process. If the customer decides not to place an order for the quoted proposal, the service delivery process is discontinued.

The tasks and responsibilities of the participants in the presales stage are presented in detail in Table 13. Using the same logic, the tasks and the responsibilities of the participants in the order fulfillment stage are presented in Table 14.

Table 13. The participants and their responsibilities in the presales stage.

Participant	Duties and Responsibilities in Presales stage
Customer	Sends a Request for Quote and decides whether to order after receiving the quote.
Responsible sales person	Evaluates case unit's ability to make a quote from the commercial and technical perspective and communicates the decision back to the customer.
	Specifies the equipment to be used in the customer quotation.
	Places enquiry for the subcontracting. The subcontractor is requested to present the quote in written form with detailed content with a copy of the quote to purchasing. Delivery is specified to include technical documentation, layout drawings, part lists and electrical drawings in printed and electrical format delivered to the purchasing.
	Prepares and send the quotation for add-on service delivery to the customer
	Acquires feedback from the customer for the quotation
Subcontractor	Quotes for the requested assembly and presents the quote in detailed written format according to the specifications in the enquiry.

As presented in Table 13, the presales stage has three participants. The customer sends the requests for a quote which the responsible sales person then processes. The responsible sales person involves the subcontractor by placing an enquiry for subcontracting. The details of the content of the subcontractor enquiry, which was one of the areas requiring improvement, are shown in Table 13.

If the customer decides to place the order for the quoted proposal, the add-on service delivery proceeds to the order fulfillment stage. As presented in Table 14, the order fulfillment stage of the add-on service delivery involves more participants than the presales stage. After receiving the order from the customer, the responsible sales person inspects the order and starts processing it to the ERP system. The first step to do is to request new item codes for the customized add-on service delivery. This was identified

as a second area requiring for improvement which is why the responsible sales person is specified to request new item code as subcontracted item as presented in Table 14. After the item code is requested and created, the responsible sales person enters the new sales order to the ERP system to start the delivery at the system level, and the other internal participants are able to handle their part of the delivery process.

The third, and final, area requiring improvement was to establish common practices to store the technical documentation into a location where it would be accessible by others. The workshops produced the idea to use the ERP system as a location to keep the technical documentation since the ERP system contains the possibility and it is accessible by all the members of the case unit. As presented in Table 14, the responsibility to store the related documentation is with the responsible sales person with purchasing operating as a backup.

Table 14. The participants and their responsibilities in the order fulfillment stage.

Participant	Duties and Responsibilities in order fulfillment stage
Customer	Places the order and receives the ordered add-on service delivery
Responsible sales person	Inspects that the order complies with the quotation
	Requests new item codes to ERP system using “subcontracted item” code in the request.
	Enters the new sales order to ERP system
	Ensures the possible additional in-house tasks are applied to the delivery before it is shipped.
	Stores the technical documentation received from the subcontractor to the ERP system.
Sales Order Processing	Creates new item codes to ERP system according to the request using “subcontracted item” code.
Purchasing	Places new purchase orders for non-stocked equipment
	Places purchase order for subcontracting
	Acts as a backup to store the technical documentation
Equipment supplier	Supplies the purchased equipment
Warehouse	Receives equipment from the suppliers
	Sends equipment to subcontractor
	Receives finished goods from the subcontractor
	Sends finished goods to the customer
Subcontractor	Builds the assembly with accessories according to the purchase order.
	Delivers the technical documentation of the delivery according to the original quote.

Specifying the participants and their responsibilities in each step of the add-on service delivery process concludes the building of the draft proposal for the case. The illustration of the draft proposal for add-on service delivery process is presented in Figure 12, including the improvements gathered from the workshops. Similarly, the participants and their responsibilities related to the presales stage of the add-on service delivery process are presented in Table 13. And the participants and their responsibilities of the order fulfillment stage are shown in Table 14.

The next section discusses the feedback received on the draft proposal and presents the final proposal.

6 Validation of the Proposal for Add-on Service Delivery Process

This section discusses the methods used to have the draft proposal validated. The feedback from the validation was incorporated into the draft proposal for an add-on service delivery process to create the final proposal. After the final proposal had been created, an action plan was made to identify the first steps needed to get the final proposal implemented into case unit operation.

6.1 Overview of Validation of the Proposal

The validation of the proposal was accomplished by presenting the draft proposal for add-on service delivery process to the head of the case unit. The proposal was presented as a process flow chart as presented in Section 5, Figure 12. The process was presented using PowerPoint presentation. To present the participants and their responsibilities in each step of the process, the information of Section 5 Table 13 and Table 14 was used side-by-side with the draft proposal illustration. By using the figures and tables as described, the proposal for add-on service delivery process was discussed in detail. The feedback for the draft proposal was collected as Data 3, and it was used to build the final proposal, which is presented in Section 6.3.

The decision to collect feedback on the draft proposal from a single source was made by the researcher and it was based on the method used to build the proposal and on the structure of the case organization. The draft proposal was built in cooperation with the key stakeholders of the case unit and, therefore, their insights were captured in the building of the proposal stage.

The next Section discusses the received feedback and describes the incorporation of the feedback into the final proposal.

6.2 Feedback for the Draft Proposal

The feedback for the draft proposal for add-on service delivery process, which was built in Section 5, was collected from the head of the case unit. The feedback captured is presented in Table 15. The color coding used in Table 15, orange and green, indicates the nature of the feedback. The positive feedback, emphasized in Table 15 in green

color, was received for the proposal as a whole. The points which need to be further improvement, related to the decision-making points during the presales stage of the add-on service delivery process, are emphasized in orange.

Table 15. Feedback on the draft proposal

Position	Type of feedback	Direct Quote (Data 3)
Director of the Unit	Positive	"This is a good proposal, and it clarifies the points of the process which need to be improved."
	Need Further improvement	"The decision-making points during the presales stage need to be emphasized and made clearly visible. The decision to quote or not need to be decided in cooperation with me. Also, after quotation has been received from the subcontractor, the evaluation of the total risk needs to be implemented, and the customer quote discussed with me. This ensures these decisions follow the company's internal policy."

The need for further improvement concerned the two points of decision making during the presales stage of the add-on service delivery process. The first point of decision-making needing improvement is the point after the Request for Quote has been received from the customer and the decision to whether to proceed to quote has to be reached. The second point of decision-making which needs improvement in the draft proposal is the point to evaluate the risk of the customer quotation before it is sent. This takes place after the quote for subcontracting has been received from the subcontractor and the needed pieces of information are available for the responsible sales person to prepare the customer quote.

Both of the points which need improvement are in the presales stage of the add-on service delivery process. To incorporate the improvements to the presales stage of the add-on service delivery process, the presales stage of the process is altered as presented in Figure 13. The incorporated improvements are highlighted in Figure 13 by using a green color. The additions and improvements to the responsibilities during the presales stage are presented in Table 16. As presented in Table 16, one additional

participant, the sales director, is required in the presales stage of the process to provide the support for decision making.

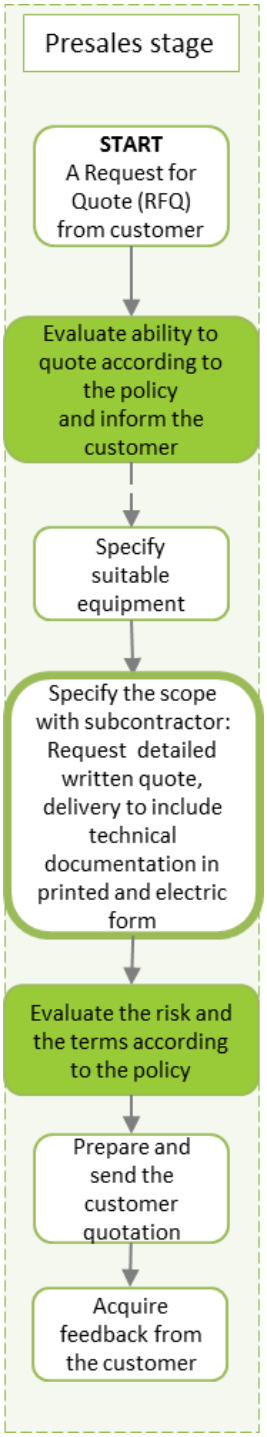

Figure 13. Presales stage of the process incorporated with feedback from validation

The steps included in the presales stage are discussed now referring only to the points highlighted in green color as presented in Figure 13. All the other steps remained unchanged compared to the draft proposal and were discussed in detail in Section 5.2.

Evaluate ability to quote according to the policy and inform the customer

When the RFQ is received from the customer, and the responsible sales person makes an initial decision, based on the commercial and the technical perspectives, whether the quotation is reasonable to prepare. This initial decision is discussed with the sales director before the decision is communicated to the customer. If the decision is not to quote, the process will be terminated here.

Evaluate the risk and the terms according to the policy

The risk included in the customer quotation is evaluated before the quotation for the customer is prepared. The risk evaluation is discussed with the sales director before the preparing of the quotation can continue. If the decision is not to proceed to quote, the process will be terminated here, and the result will be communicated to the customer.

Table 16 presents the changes to participant responsibilities in the presales stage after the improvements from the validation are incorporated. The additional participant is the sales director with whom the responsible sales person discusses the decisions before they are made final. The changed fields are presented in green color.

Table 16. Additions and changes to participants and responsibilities based on validation feedback

Participant	Duties and Responsibilities in Presales stage
Responsible sales person	Evaluates case unit's ability to make a quote from the commercial and technical perspective and discusses the decision with the sales director. After the decision is made, communicates the decision back to the customer.
	Evaluates the risk of the customer quote and discusses with the sales director
Sales Director	Discusses the decision to quote and the risk evaluation with the responsible sales person to support decision making.

As presented is Table 16, the responsible sales person makes the initial decision to quote, but needs to discuss the decision before proceeding to inform the customer. The same also applies to the risk evaluation, which takes place after the initial decision to quote has been made, and the quotation from the subcontractor has been received. At this point, the responsible sales person makes an evaluation of the risk related to the customer quotation and before proceeding, discusses the risks with the sales director.

As the feedback from the validation revealed, the points needing improvement were both in the presales stage of the add-on service delivery process which means that the order fulfillment stage of the draft proposal was accepted as it was proposed. The next section presents the complete final proposal including the improvements from the validation.

6.3 Final Proposal

This section presents the final proposal for the add-on service delivery process with the improvements incorporated from the validation process. The final proposal is presented in Figure 14. The add-on service delivery process as a whole follows the process flow of the draft proposal presented in the building of the proposal stage in Section 5.4. As presented in Figure 14, the add-on service delivery process consists of two main stages, the presales stage, and the order fulfillment stage. The differences between the draft proposal for add-on service delivery process presented in Section 5.4 Figure 12, and the final proposal, presented in Figure 14, are highlighted in green.

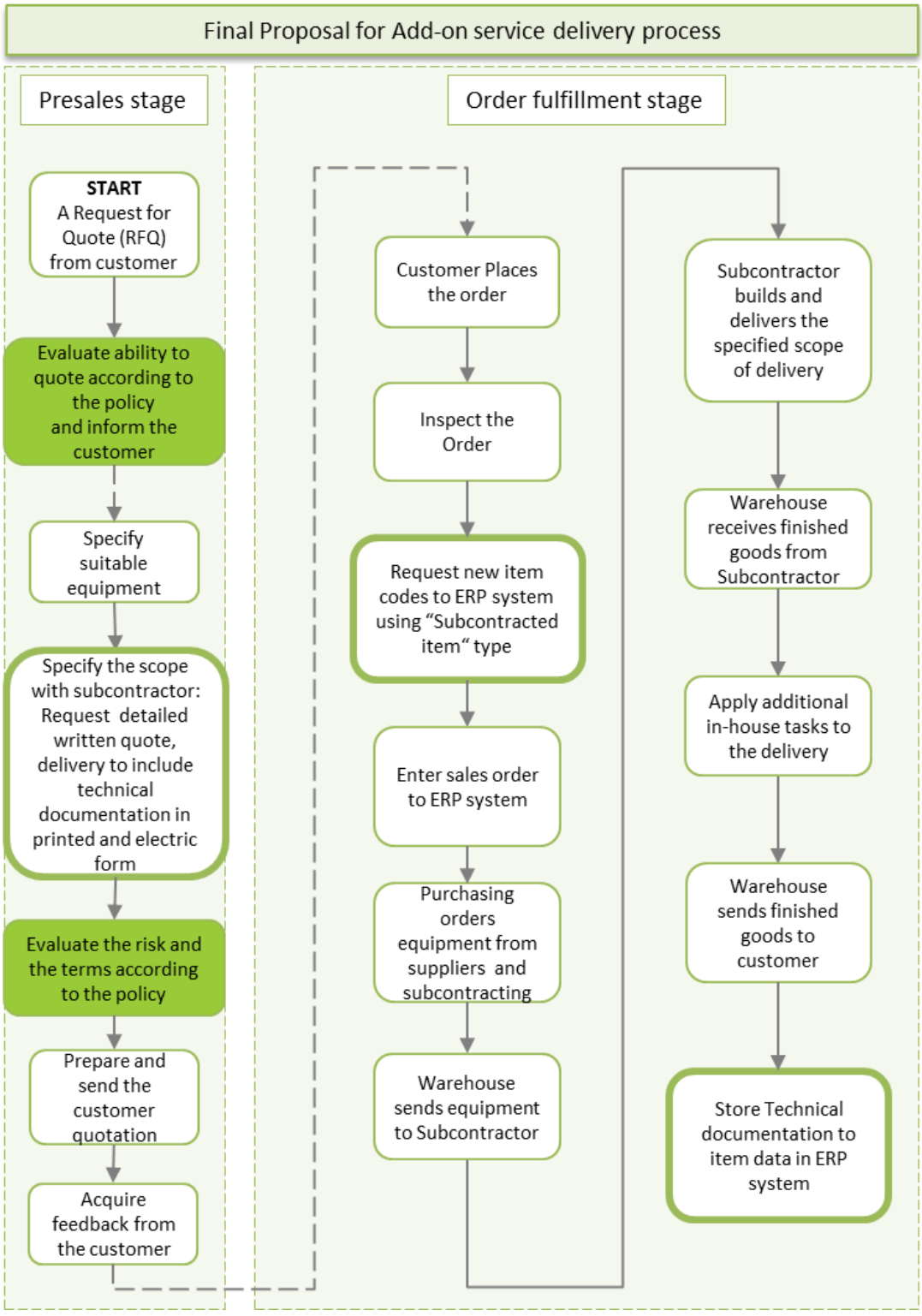

Figure 14. Final proposal for improved add-on service delivery process

As presented in Figure 14, the final proposal for the improved add-on service delivery process contains more control over the decision-making in the presales stage, as compared with the draft proposal which is presented in Section 5, Figure 12. The increased control ensures that the presales stage of the add-on service delivery process functions

in a unified way as the decisions are not made by sole individuals but between the responsible sales person and the sales director. It also ensures that the aspects and the risks related to the add-on service delivery are evaluated according to the company policy before the customer quotation is placed.

The participants and their responsibilities in the presales stage of the add-on service delivery process are presented in Table 17. As presented in Table 17 and discussed in Section 6.2, the final proposal includes one new participant in the presales stage, which is the sales director and accordingly the decision-making point are specified in more detail compared with the draft proposal. To highlight the new elements, the green color highlights the columns in Table 17, which includes the incorporated improvements from the validation process. The role of the sales director is to discuss the decisions related to the quotation with the responsible sales person before final decisions are made.

Table 17. Participants and their responsibilities in the presales stage

Participant	Duties and Responsibilities in Presales stage
Customer	Sends a Request for Quote and decides whether to order after receiving the quote.
Responsible sales person	Evaluates case unit's ability to make a quote from the commercial and technical perspective and discusses the decision with the sales director. After the decision is made, communicates the decision back to the customer.
	Specifies the equipment to be used in the customer quotation.
	Places enquiry for the subcontracting. The subcontractor is requested to present the quote in written form with detailed content with a copy of the quote to purchasing. Delivery is specified to include technical documentation, layout drawings, part lists and electrical drawings in printed and electrical format delivered to the purchasing.
	Evaluates the risk of the customer quote and discusses with the sales director.
	Prepares and send the quotation for add-on service delivery to the customer.
	Acquires feedback from the customer for the quotation
Sales Director	Discusses the decision to quote and the risk evaluation with the responsible sales person to support decision making.
Subcontractor	Quotes for the requested assembly and presents the quote in detailed written format according to the specifications in the enquiry.

The participants and their responsibilities in the order fulfillment stage of the add-on service delivery process are presented in Table 18. The list of the participants remained unchanged from the draft proposal and is discussed next.

Table 18. Participants and their responsibilities in the order fulfillment stage

Participant	Duties and Responsibilities in order fulfillment stage
Customer	Places the order and receives the ordered add-on service delivery
Responsible sales person	Inspects that the order complies with the quotation
	Requests new item codes to ERP system using "subcontracted item" code in the request.
	Enters the new sales order to ERP system
	Ensures the possible additional in-house tasks are applied to the delivery before it is shipped.
	Stores the technical documentation received from the subcontractor to the ERP system.
Sales Order Processing	Creates new item codes to ERP system according to the request using "subcontracted item" code.
Purchasing	Places new purchase orders for non-stocked equipment
	Places purchase order for subcontracting
	Acts as a backup to store the technical documentation
Equipment supplier	Supplies the purchased equipment
Warehouse	Receives equipment from the suppliers
	Sends equipment to subcontractor
	Receives finished goods from the subcontractor
	Sends finished goods to the customer
Subcontractor	Delivers the assembly with accessories according to the purchase order.
	Delivers the technical documentation of the delivery according to the original quote.

As presented in Table 18, the participants and their responsibilities in the order fulfillment stage of the add-on service delivery process remained unchanged when comparing it with the draft proposal. The customer acts as an initiator of the process which then follows the linear process from order to delivery as discussed in detail in the building of the proposal stage in Section 5.4.

This concludes the presentation of the final proposal. The next section presents the action plan for the first steps to get the final proposal implemented as add-on service delivery process for the case unit.

6.4 Action Plan to Implement the Add-on Service Delivery Process Improvements

After the final proposal for the add-on service delivery process had been validated, the researcher made an action plan to get the implementation of the process improvements started. There were three main issues found in the CSA to which process improvements were proposed. These included methods to purchase subcontracting, methods to work with the company ERP system and practices to store the records of delivered systems. As discussed in Section 3 and Section 5.3, the methods to work with the company ERP have the largest impact of the identified three issues on day-to-day work of the stakeholders. For this reason, the researcher decided that it would be the most suitable starting point for implementing the improvements. As discussed in Section 5.3.1, the workshops with the stakeholders concluded that internal group discussions and additional training would be the most suitable way to establish common practices to work with the ERP system in add-on service delivery.

The group discussion and training sessions to establish common practices to work with the ERP system are to be held with the internal stakeholders, which are the sales order processing, purchasing, and the sales personnel. The responsibility to facilitate the sessions belongs to the owner of the add-on service delivery process. These actions would be most beneficial to start without a further delay. After the methods for common practices are agreed, the practices need to be transferred into continuous daily operation. The first step is to check the existing deliveries and ensure that they are set to the ERP system as subcontracted items.

To ensure the unified practices in working with ERP system transfer also to daily operations, a template for requesting new subcontracted items is introduced. This template is presented in Appendix 3 of this thesis. The person who makes a request for subcontracted item code to the ERP system is instructed to do it by using the preformulated template which delivers all the needed basic information and practically ensures that the methods to work with ERP become unanimous.

The action plan for the first steps to implement the improvements for the add-on service delivery process concludes this section for validation of the proposal. The next Section provides a summary of the thesis as well as compares the outcome of the thesis to the objective. In the same manner also, the reliability and validity of the thesis are evaluated.

7 Discussion and Conclusions

This section presents a summary of the thesis and makes an evaluation of the thesis. The evaluation focuses on comparing the thesis outcome to the objective as well as and considers the validity and reliability of the thesis.

7.1 Summary

This thesis set out to improve the existing process for add-on service delivery in the case unit. The process itself has existed, but there has not been a written description of it until now. Without written documentation it becomes difficult for any organization to set or maintain common practices to operate. Also, the ownership of the process, as well as the systematic, continuous improvement, cannot be controlled without the process documentation. The Current State Analysis revealed that there is one particular type of add-on service, named complex customized add-on service, which causes the most difficulties in the organization to deliver. The difficulties derive from the nature of the process since the delivery requires external resources, such as subcontractors to participate.

This study shows that to improve the complex customized add-on service delivery, the improvements need to cover the whole process which includes both the presales stage and the order fulfillment stage of the add-on service delivery. The presales stage occurs before the customer has made the decision to buy and the order fulfillment begins when the customer places the order.

The whole add-on service delivery process has three main issues, one of which occurs in the presales stage and two of which occur in the order fulfillment stage. The issue in the presales stage is related to the purchasing of the subcontracting. The first of the two issues in the order fulfillment stage is related to current practices to work with the ERP system and the second issue is related to the lack of common methods to store the technical documentation into an accessible location.

The draft proposal for the improved add-on service delivery process, presented in Section 5.4, is a combination of three main elements. These elements are the Data 1 from CSA, the Conceptual Framework for complex add-on service delivery process and the Data 2 from the workshops. The Conceptual Framework for the complex add-on ser-

vice delivery process is presented in Section 4.4. The draft proposal combines Data 1 from the CSA as a base of the add-on service delivery process. The Conceptual Framework builds the theoretical background on *how* the identified issues can be improved and Data 2 delivers the stakeholder insights on *how* to apply the improvements in practice.

The draft proposal received positive feedback in the validation from the head of the case unit. The draft proposal was stated to bring clarity to the process and clearly point out the need for the improvements. On the other hand, the decision-making in the presales stage was considered to be too vague, so it needed further improvement. The received feedback was incorporated into the final proposal for the improved add-on service delivery process and is presented in Section 6.4.

Summing up, this thesis was able to point out, and provide improvements, to the identified issues in the current add-on service delivery process. The outcome of this thesis is the improved add-on service delivery process which helps the case unit to operate more systematically when delivering the add-on services.

Next the managerial implications of this thesis are explained.

7.2 Managerial Implications

This thesis focused on improving the add-on service delivery process and presented an improved add-on service delivery process as the outcome. The improvements in the proposal serve both the users of the process in their daily operations as well as the case unit as an entity, as it enables the organization to possess the knowledge of the delivered add-on services even in the case of employee turnover. The improved process increases the visibility and the clarity throughout the process which makes it easier for new users to approach it.

For the case unit to extract maximal benefit from this thesis, it would be most beneficial to follow the action plan presented in Section 6.4 to get the process improvements implementation started. The very first step for the case unit would be to nominate the owner of the process who is then in charge of organizing the implementation and ensures the continuous improvement to the new process, especially in the learning phase of it.

This thesis did not take into account the financial aspects of the add-on service delivery process, such as what is the current expenditure on the subcontracting in general. The same applies to the question whether there could there be additional benefits achievable if the subcontracting was focused on a lesser number of subcontractors. The financial elements could be topics for future studies, and should be concentrated as the volumes of the add-on service deliveries increase. The only financial element which the improved add-on service process is expected to have an impact on is the reduction of hidden costs related to the deliveries as the vagueness of the overall process is now reduced.

7.3 Evaluation of the Thesis

The evaluation of this thesis, conducted by the researcher, was done for both the outcome of this thesis as well as for the validity and the reliability of this thesis. The following sections discuss both of the evaluations separately. Both validity and reliability are reflected on the validity and reliability plan introduced in Section 2.4.

7.3.1 Outcome vs. Objective

The objective of this thesis was to improve the add-on service delivery process for the case unit. As stated in the research design in Section 2.2, the selected method to pursuit make the objective meet the outcome was to conduct a CSA to identify the issues which needed improving. The issues identified in the CSA stage steered the focus of the improvement to one particular type of add-on service, named complex customized add-on service since the interviews indicated that there were numerous issues included in the delivery process. At the same time, the strengths of the current process were also identified so that they would not be lost during the improvement process. The main findings from the CSA revealed issues to be improved which serve both the day-to-day operations of the organization as well as the long-term capability of the organization to deliver the add-on services to customers.

The final proposal for the improved add-on service delivery process, which is the outcome of this thesis, is able to address improvements to the issues detected in the CSA. If monitored from helicopter view the outcome is similar to the original add-on service delivery process. This is due to the selected method of not fixing something that is not broken. But by taking a closer look, it can be seen that the difference is that the former-

ly vague and unclear areas of the process have been defined and specified in detail. The outcome was not implemented or tested in practice as a part of this thesis. Therefore, it is most likely that it will require some minor tweaks to be applied before it can be fully implemented to practice. Also, the mindset of continuous improvement insists that the process cannot be a static “apparatus”, but it has to agile to serve the business need. All the improvements to the process were built and validated with the expertise of the key stakeholders. Therefore, it can be stated that the outcome of this thesis was able to meet the objective. This ends the evaluation of the outcome, and the next section evaluates the reliability and validity of the thesis.

7.3.2 Validity and Reliability

As stated in validity and reliability plan of this study in Section 2.4, this section will evaluate how the validity and the reliability are visible in this thesis. As stated in Section 2.4, the researcher is a member of the organization and therefore is biased although in his biased opinion he was able to keep the bias in the background. For any of the decisions made by the researcher during the course of this thesis, the reasoning is provided at each point.

To evaluate the validity of this thesis is limited to evaluating the internal validity as specified by Quinton and Smallbone (2006) and as stated in Section 2.4. The internal validity focuses on evaluating whether the researcher was able to deliver what was promised, meaning that does the outcome reflect on the objective of the research. The method to collect data in this thesis was mainly by interviews as it was seen as the most accurate and practically only way to find out the current process practices since there is no existing written process available for the add-on service delivery. The questions used for the interviews were not fully accurate and most likely using another set of questions the result for this thesis could have been different in some of the details. For the benefit of this thesis, the participants for both the CSA interviews, as well as workshops, were highly cooperative and willing share their expertise on the subjects. The level of cooperation also enabled the check-up round for further questions after the first interview round for the CSA as the analysis of the interviews revealed that issues related to the process detail were left undiscussed at the first time. As stated in the section 7.3.1 this thesis was able to deliver what the researcher promised it would.

The reliability of the thesis is evaluated by comparing the reliability plan to the actual outcome. As stated in Section 2.4 this thesis set out to use the three principles of Yin (2003) to increase the reliability. These principles are, as defined by Yin (2003), to use multiple sources of data for triangulation, producing an organized database for the collected data and building a chain of evidence through the reasoning. According to the researcher, these principles were followed. For the triangulation, the interviewees were from different functions of the organization within the case unit. The review of documents was conducted, but the existing documentation contributed to the thesis only very little since they were considered mostly unrelated. The database was built as suggested by Yin (2003) to contain all the documentation related to the interviews with their raw field notes and the researchers used as sources of information, but not all to the books used as references when studying the best practices. The chain of evidence was built by using direct quotes from the interviews to demonstrate that the researcher was not reflecting his own ideas, but instead, he was presenting the results of the stakeholder interviews.

7.4 Closing Words

To stay competitive in the industrial business-to-business environment calls for an active approach from a local equipment distributor. The competitive advantage for the distributor is most likely to be gained by from differentiating from the competition rather than by pure cost management. By focusing on understanding the customer need and building the offering based on it is a certain opportunity to differentiate. This puts the distributor's capability to efficiently meet the customer need into the center of the operations.

This study has shown how the current add-on service delivery process needs to be improved and how the improvements can be implemented. By following the recommendations suggested in this Thesis, the improved add-on service delivery process has a high potential to increase the competitive advantage of the case unit.

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Details	
Name (code) of the informant	*1A*
Position in the case company	Product Manager
Date of the interview	February 2016
Duration of the interview	25min

QUESTIONS	FIELD NOTES
1. Please, describe what kind of services do you provide currently?	
2. How does for example new add-on service case get started and what are the needed steps? *What are the roles?* *Who does what?*	
3. Who makes decisions?	
4. What are the strengths of this model?	
5. What areas would need improvement?	
6. What is the most critical area to improve?	

Details	
Name (code) of the informant	*1B*
Position in the case company	Product Manager
Date of the interview	February 2016
Duration of the interview	100min

QUESTIONS	FIELD NOTES
1. Please, describe what kind of services do you provide currently?	
2. How does for example new add-on service case get started and what are the needed steps? *What are the roles?* *Who does what?*	
3. Who makes decisions?	
4. What are the strengths of this model?	

5. What areas would need improvement?	
6. What is the most critical area to improve?	
7. Other ideas or concerns that you would like to share?	
ADDITIONAL QUESTIONS:	
How do you specify the type and format of the technical documents, such as drawings to be included in the subcontractor's scope of delivery?	
Is the technical documentation stored into a known location where it is accessible by others?	

Details	
Name (code) of the informant	*1C*
Position in the case company	Product Manager
Date of the interview	February 2016
Duration of the interview	100 min

QUESTIONS	FIELD NOTES
1. Please, describe what kind of services do you provide currently?	
2. How does for example new add-on service case get started and what are the needed steps? *What are the roles?* *Who does what?*	
3. Who makes decisions?	
4. What are the strengths in this model?	
5. What areas would need improvement?	
6. What is the most critical area to improve?	

7. Other ideas or concerns that you would like to share?	
ADDITIONAL QUESTIONS:	
How do you specify the type and format of the technical documents, such as drawings to be included in the subcontractor's scope of delivery?	
Is the technical documentation stored into a known location where it is accessible by others?	

Details	
Name (code) of the informant	*1D*
Position in the case company	Product Manager
Date of the interview	February 2016
Duration of the interview	90 min

QUESTIONS	FIELD NOTES
1. Please, describe what kind of services do you provide currently?	
2. How does for example new add-on service case get started and what are the needed steps? *What are the roles?* *Who does what?*	
3. Who makes decisions?	
4. What are the strengths in this model?	
5. What areas would need improvement?	
6. What is the most critical area to improve?	
7. Other ideas or concerns that you would like to share?	

Details	
Name (code) of the informant	*1E*
Position in the case company	Product Manager
Date of the interview	February 2016
Duration of the interview	75 min

QUESTIONS	FIELD NOTES
1. Please, describe what kind of services do you provide currently?	
2. How does for example new add-on service case get started and what are the needed steps? *What are the roles?* *Who does what?*	
3. Who makes decisions?	
4. What are the strengths in this model?	
5. What areas would need improvement?	
6. What is the most critical area to improve?	
7. Other ideas or concerns that you would like to share?	

Details	
Name (code) of the informant	*1F*
Position in the case company	Technical Customer Service
Date of the interview	February 2016
Duration of the interview	60 min

QUESTIONS	FIELD NOTES
1. Please, describe what kind of services do you provide currently?	
2. How does for example new add-on service case get started and what are the needed steps? *What are the roles?* *Who does what?*	
3. Who makes decisions?	
4. What are the strengths in this model?	
5. What areas would need improvement?	
6. What is the most critical area to improve?	
7. Other ideas or concerns that you would like to share?	

Details	
Name (code) of the informant	*1G*
Position in the case company	Purchaser
Date of the interview	February 2016
Duration of the interview	60 min

QUESTIONS	FIELD NOTES
Please, let's go through the delivery cases where sub-contractor work is included in the delivery process. Is it a clear process for you? *Or what would be the issues?*	

Details	
Name (code) of the informant	*Workshop 2A*
Participants	Purchaser Warehouse employer Customer Manager
Date of the interview	April 2016
Duration of the interview	50min

QUESTIONS	FIELD NOTES
1. How should the subcontractor enquiry be formulated? *What needs to be included?*	
2. How should the request of new codes be handled to ensure the codes are correctly used in ERP?	
3. How and where and by whom should the technical documentation be recorded?	

Details	
Name (code) of the informant	*Workshop 2B*
Participants	Product Manager Product Manager
Date of the interview	April 2016
Duration of the interview	60min

QUESTIONS	FIELD NOTES
1. How should the subcontractor enquiry be formulated? *What needs to be included?*	
2.How should the request of new codes be handled to ensure the codes are correctly used in ERP?	
3. How and where and by whom should the technical documentation be recorded?	

No	Description of the required information	To be filled by the requester:
1	New Item Code (in ERP)	
2	Item code descriptive name (printed on delivery documentation)	
3	Subcontractor (Supplier Number in ERP)	
4	Bill of Material (Equipment Item codes in ERP)	
5	Purchasing price for the subcontracting	
6	Minimum quantity to purchase	
7	Lead time for the subcontracting (in working days)	
8	Stocked item? (YES/NO)	
8a	If stocked item, minimum stock quantity to place new purchase order	
9	Sales price in EUR for the Finished Goods	